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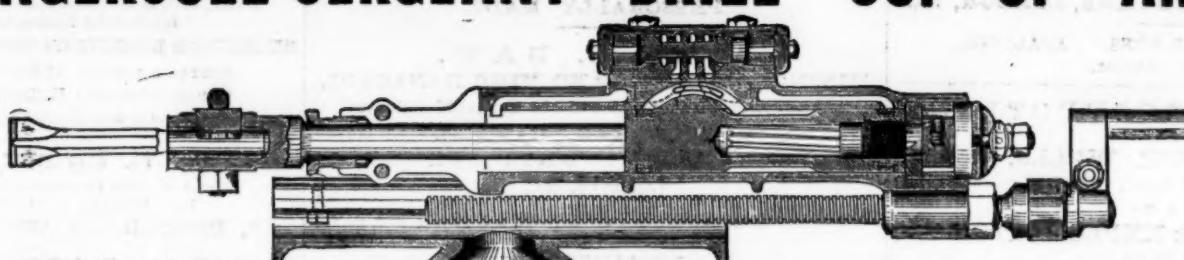
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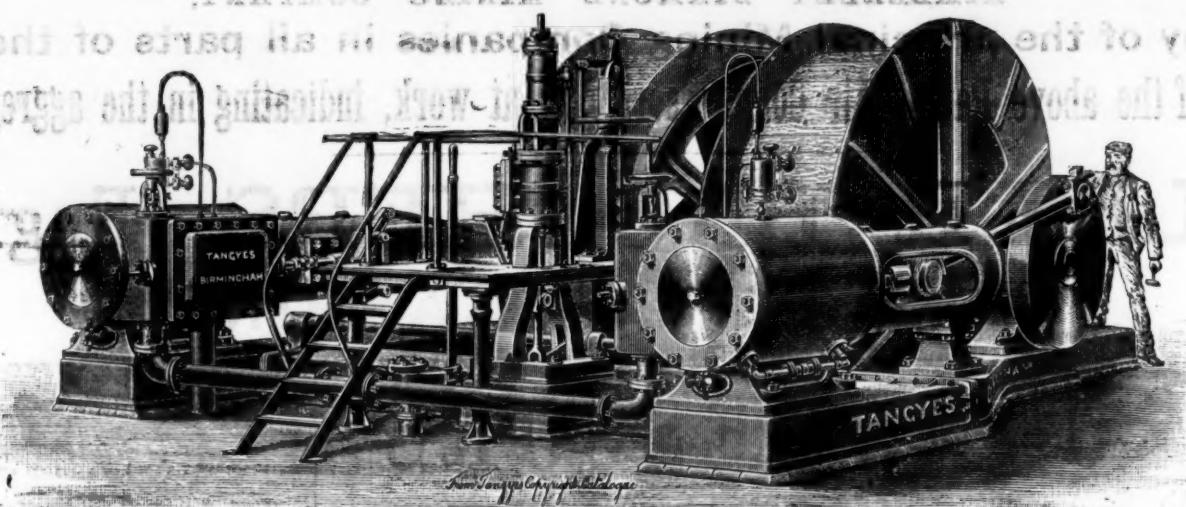
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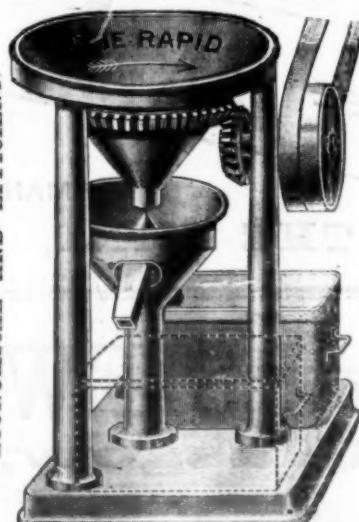
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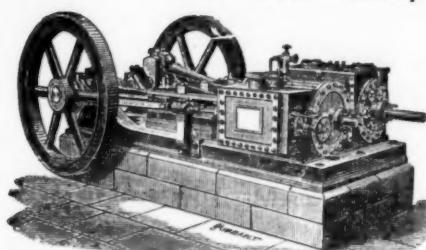
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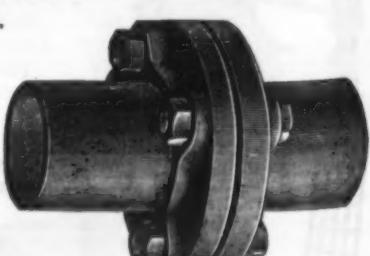
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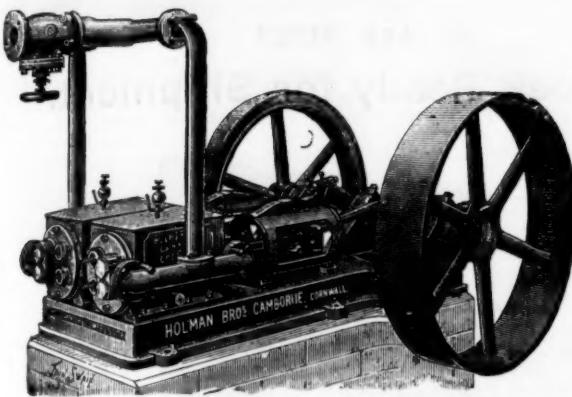
PLAN OF PATENT FLANGED JOINT.

Head Offices : 41, OSWALD STREET, GLASGOW.

# HOLMAN Bros., Camborne, Cornwall.

ESTABLISHED 1839

**Patentees and Sole Makers of  
"THE CORNISH" ROCK DRILL and "THE CORNISH" COMPRESSOR**



## RECORD OF WORK DONE

At Botallack Mine, St. Just, Cornwall, **TWELVE MEN** with **TWO new Patent CORNISH ROCK DRILLS** drove, sunk, and rose **288 FATHOMS** in **12 MONTHS**, equal to five times the Speed of Hand Labour.

At Wheal Grenville Mine, Camborne, Cornwall, **SIX MEN** with **TWO new Patent CORNISH ROCK DRILLS** started from the **150 FATHOMS** level and put up in **EIGHT MONTHS** a **11 FEET** by **5 FEET PERPENDICULAR RISE 46 FATHOMS 5 FEET 6 INCHES**, and about midway drove **1 FATHOM 5 FT.** No communication of any kind was effected until hoisting to the Shaft brought down from surface.

**Estimates for ROCK BORING PLANT and GENERAL MINING MACHINERY on Application.**

London Representative : Mr. E. M. TOUZEAU, Leadenhall Buildings, London, E.C.

FIRST  
SILVER MEDAL,  
Highest Award,  
Mining Institute  
Contest, 1881.

Three Makers  
represented.

**AWARDED SILVER MEDAL INTERNATIONAL  
INVENTIONS EXHIBITION, 1885.**



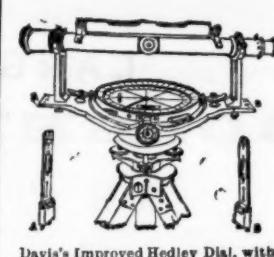
FIRST  
SILVER MEDAL  
Highest Award,  
Royal Cornwall  
Polytechnic  
Jubilee Exhibition  
Contest, 1882.

Five Makers  
represented.

**JOHN DAVIS AND SON,**  
ALL SAINTS WORKS, DERBY;  
118, NEWGATE STREET, LONDON.



Transit Theodolite with Patent Hoffman Tripod Head.

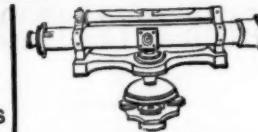


Davis's Improved Hedley Dial, with Telescope and Sights Interchangeable and Patent Hoffman Tripod Head.

## MINING, SURVEYING AND ENGINEERING INSTRUMENTS

### THEODOLITES, LEVELS,

Davis's Improved  
Hedley Miners Dials  
With HOFFMAN  
PATENT TRIPOD HEAD.



AND ALL DESCRIPTIONS OF MATHEMATICAL AND MINING SURVEYING INSTRUMENTS.

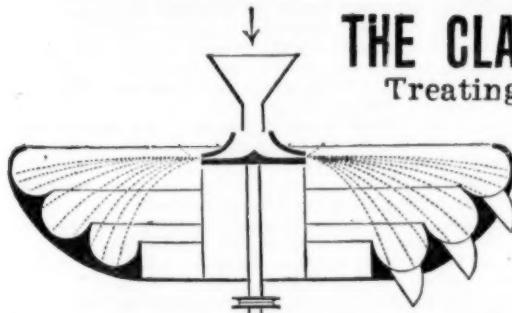
Revised Illustrated Catalogues Free to any Part of the World.  
SECTION (A) MATHEMATICAL DEPARTMENT AND SAFETY LAMP  
SECTION (B) ELECTRICAL DEPARTMENT.

Gold Medal Awarded Mining Exhibition, 1890.  
"THE ENGINEERING TELEGRAPH CODE USED."

M R. P. S. HAMILTON (late Chief Commissioner of Mines of the Province of Nova Scotia), PRACTICAL GEOLOGIST, MINING AGENT and MINING ENGINEER, HALIFAX, NOVA SCOTIA. PURCHASES and SALES of MINING PROPERTY effected, with careful regard to the interests of clients.

## Highest Award at the Mining Exhibition, 1890.

# DRY CONCENTRATION.



THE CLARKSON-STANFIELD CONCENTRATOR (LIMITED), are successfully treating the ores of Gold, Silver, Copper, Lead, Tin, Zinc, Cobalt, &c., &c. of all degrees of fineness, from 30 to the finest meshes by their NEW MACHINERY which may be seen in operation at

6, COLONIAL AVENUE, MINORIES, LONDON, E.

Homogeneous substances, such as Emery, Glass, Sand, Sulphur, Black Lead, &c., graded according to size in one operation.

Terms for Experimental Concentration, and for Supply of Machines on Application.

### NEW PATENTS.

LIST of APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs. Hayner and Company, Patent Agents, 37, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

244 George Victor Priestly, Basinghall Street Chambers, Boar-lane, Leeds.—Improvements in steam generators.—February 5.  
2448 Hugo Kohl, 5, Metzlerstrasse Cologne, Germany.—Feed-water heater.—February 5.  
2549 George Paley, Bank Top Mills, Preston.—An improved faller casing and regulating motion for spinning mules.—February 6.  
2555 Horace Robinson, 78, Great Bridgewater Street, Manchester.—Improvements in oil or inflammable liquid engines.—February 6.  
2621 Charles Scott Gallaway, 16, Lincolns Inn Fields, London.—An improved tubular steam generator.—February 6.  
2642 Charles Albert Miller, Fred. John Miller, and Arthur Richards, 6, Liverys Street, Birmingham.—Improvements in adjustable spanners and wrenches.—February 7.  
2645 Joseph Smith and Isaac Smith, Commercial Street, Halifax.—An improved construction of fire-box for steam boilers.—February 7.  
2720 John Giers, 46, Lincolns Inn Fields, London.—Improvements in the construction and working of melting and heating.—February 7.  
2756 William John Davies and David Evans, Bristol Bank Buildings, Bristol.—An improvement relating to miners cages.—February 8.  
2760 Alexander Turnbull and Robert Richardson, 62, St. Vincent Street, Glasgow.—Improvements in trams.—February 8.  
2813 Ernest Otto Schlick, 45, Southampton Buildings, Chancery Lane, London.—Improvements in steam engines.—February 8.  
2823 William John Marshall and James McNeil, 37, St. Vincent Street, Glasgow.—Improvements in or connected with drop hammers.—February 9.  
2853 James Pyle, 115, St. Vincent Street, Glasgow.—An appliance for preventing explosions in range boilers.—February 9.  
2867 Ossian Albert Ringborn, 18, Buckingham Street, Strand, London.—Improvements relating to suction and force pumps.—February 9.  
2892 William Weston Longsdorf, 73, Chapside, London.—Improvements in adjustable wrenches.—December 9.  
2957 Edward Besuit, 6, Lord Street, Liverpool.—Improvements in or relating to steam blower or forced draught apparatus for furnaces.—February 10.  
2970 Thomas Walron Smith, 12, Southampton Buildings, Chancery Lane.—An improvement in gas and oil motor engines.—February 10.

### SPECIFICATIONS PUBLISHED.

1861, Bestler, motive power engines, 1893; 3332, Hartley and Kerr, gas engines, 1893; 3711, Fairbairn, steam generator, 1893; 4225, Bedlam, steam and ingot iron, 1893; 5719, Mellor, miners' picks, 1893; 6534, Bark, gas and oil engines, 1893.

The above specifications published may be had of Messrs. Hayner and Company 18, Chancery Lane, London, at 10d. each including postage.

THE FOUNDATION OF ANYTHING OF VALUE must be carefully laid or permanent foundation, and the same may be said of every undertaking in life. Success to have a permanent effect must be created upon something solid or it will crumble into ashes when seemingly within our grasp. This remark is particularly applicable to our health for if it is not firmly established through the blood being pure and the stomach in regular order, we are liable at any time to be fatally attacked by disease. Holloway's Pills and Ointment lay a foundation of good health, which will be permanent and firm as a rock.

### CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

"We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract prices should be given.

That is given that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such tenders as "The Mining Journal" should be mentioned as the original source of the information, concerning which further particulars are required.

#### HOME CONTRACTS.

Wheels and Axles, February 26 (London, E.C.).—For the supply of twelve pairs of wheels with steel axles, and 276 spare steel axles for the Bengal and North Western Railway Company (Limited). Particulars of Mr. E. L. Marrett, Secretary, 337, Gresham House, Old Broad Street, E.C.

Water-Tank, February 27 (Abergavenny).—For the erection of a water-tank to hold 320,000 gallons at the Joint County Asylum, Abergavenny. Particulars of Messrs. Swash and Bain, 3, Friar's Chambers, Newport, Mon.

Railway Stores, February 27 (India Office, S.W.).—The Secretary of State for India in council is prepared to receive tenders to supply (1) wrought-iron spikes for rails; (2) steel fish-plates; (3) steel rails; (4) crossings and switches. Conditions of contract on application to the Director-General of Stores, India Office, Whitehall, S.W.

Girders, February 27 (London, W.).—For supplying 80 tons of wrought-iron and steel girders work for bridges for the Great Western Railway Company. Plans and specifications to be seen at the Engineer's Office, Paddington Station.

Railway Stores, March 1 (London, E.C.).—For supplying the Assam Bengal Railway Company with various stores. Drawings to be seen at the office of Mr. W. Duff Bruce, 17, Victoria Street, Westminster, S.W.

Reservoir, March 6 (Hussey, Leeds).—For the construction of a covered service reservoir at Middleton, for the Hussey Union Rural Sanitary Authority. Plans and specifications of Mr. J. H. Rhodes, 92, Albion Street, Leeds, on payment of £2 5s. afterwards to be returned.

Girders, March 10 (Macclesfield).—For the supply and erection of the cast-iron girders required in the covering of the River Bollin at the gas works, for the Gas Committee. Drawings and specifications to be seen at the office of Mr. T. G. Newbigging, engineer.

Sinking Pits (Abercrombie, Monmouthshire) to the steam coal measures. For particulars apply to Messrs. John Lancaster and Co. (Limited), Blaenau, Mon.

Shade Valve, (Manchester).—For the supply of one 24-inch sluice valve for the Waterworks Committee. Plans and specifications on application to Mr. T. H. G. Bowes, Waterworks office, Town Hall, Manchester.

Excavation (Neath).—For excavation and concrete work. Apply, Eagle Tinplate Company (Limited), Neath.

Stones, (Glasgow).—For the supply of stones for one year from April 1, for the Fifeburgh Oil Company (Limited), 24, St. Vincent Place, Glasgow. Specifications and forms of tender on application at the office.

Construction of Railway (Madrid).—The Secretary of State for Foreign Affairs has received from Her Majesty's Ambassador at Madrid, a copy of a royal decree, inviting tenders for the construction of a railway from Manila to Tzal by Calamba and Batangas. The decree can be seen at the Foreign Office, S.W., on week-days between 11 and 6.

DEAFNESS AND NOISES IN THE HEAD cured at the patient's home. This Illustrated Edition also treats on the cure of Cataract, Bronchitis, Asthma, Extreme Stoutness, Indigestion, Dyspepsia, Rheumatism, by Medico-Electricity.—Ad. G. B. BRIGHT, Publisher, 8, Tavistock Place, London, W.C.—[ADVT.]

### OUR INQUIRY COLUMN.

#### TO CORRESPONDENTS.

Correspondents will please take note that all communications will in future be answered in this column and not through the medium of the post. All questions and replies should be accompanied by the name and address of the writer.

#### QUERIES.

JEROME.—1. Would some one kindly inform me whether an engine has most power with a long or a short driving belt, and why?—2. I wish to obtain some instructions how to make a pattern for cylinder casting, with a diagram.

#### REPLIES.

E. W. D.—If you will favour us with a call we shall be pleased to go into the matter with you, and give you any assistance that we can.

BREVO.—Yes ; decidedly.

VICTOR.—You should have written sooner. We fear your application will not be received in time.

J. S. B.—Spelter is quoted in our Metal Market column.

B. C.—Gold was discovered in California in 1848.

MEMO.—Enquire at Lloyd's.

M. C.—Yes ; he has published several works.

J. W.—Diamond is the hardest known substance ; it has a very high refractive power. The colorless stones are the most valued, those of a brownish tint being much less valuable. To increase the brilliancy it undergoes the process of cutting ; this is done by the aid of a revolving wheel coated with diamond dust. Diamonds are now found chiefly in Australia, South Africa, and parts of South America ; they are not so plentiful in India as formerly. Small diamonds are used for rock boring tools in addition to cutting glass.

CAMBRIAN.—Asbestos is found in Cornwall, parts of Scotland, France, Italy, and Corsica.

SUBSCRIBER.—1. It is a small island in the Atlantic lying between south-east of Labrador and north-west of Newfoundland.—2. We do not think so.

W. A. L.—The New Almaden is believed to be the richest quicksilver mine.

R. S.—There is no such institution in existence.

AFRICAN.—Will comply with pleasure.

BOND.—We shall be glad to hear from you upon your arrival.

NOVICE.—It is a substantial concern, and bears a high reputation.

FRANK.—Will be published shortly.

VOY.—The presses are of no use.

F. B.—You have not sent your address.

THE UNIVERSAL ELECTRICAL DIRECTORY.—The thirteenth issue of Mr. J. A. Berly's Universal Electrical Directory has come quite up to the usual standard of excellence. Its bulk, compared with that of former issues, is sufficient indication of the way in which this particular branch of the engineering industry has, of itself, grown into an industry, and being still in a low state of development, affords wonderful promise for the future. The directory covers not only the manufacturers in Britain, but also those on the Continent, in America, and the colonies ; and it must have been a work of immense labour.

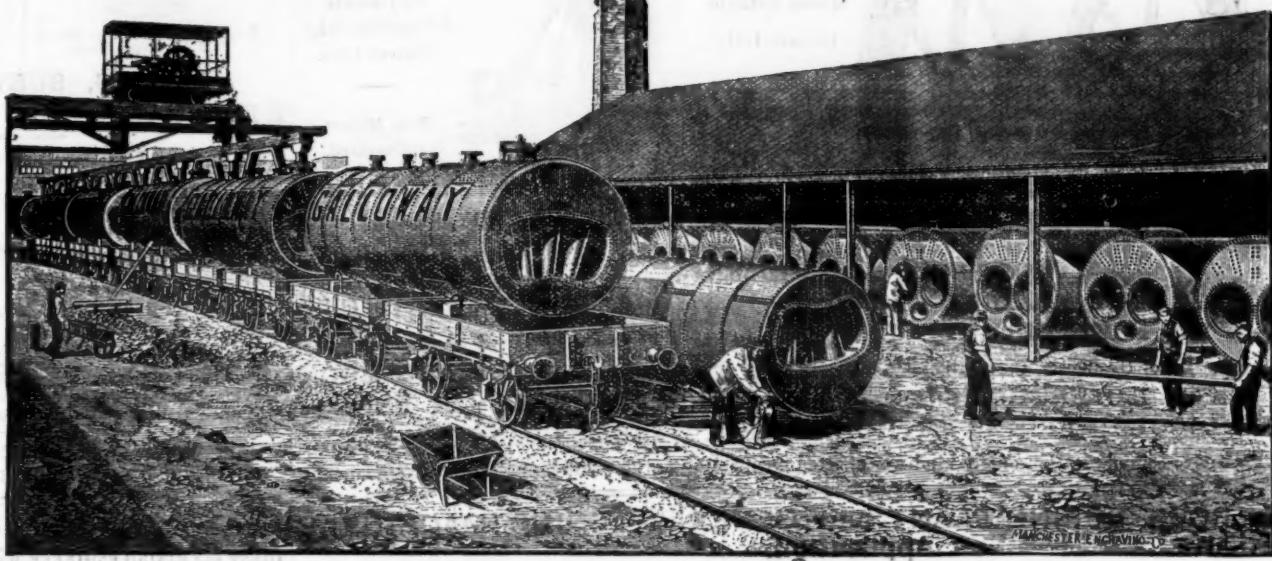
# GALLOWAYS, LIMITED,

MANCHESTER.

LARGEST STEAM  
BOILER WORKS  
IN THE WORLD.

GRAND PRIX  
PARIS, 1878 & 1889

GOLD MEDALS  
AT ALL RECENT  
EXHIBITIONS.



## MECHANICAL ENGINEERING: MACHINERY, MINING and RAILWAY PLANT, &c.

Illustrated Descriptions of New and Standard Mechanical Appliances, Accessories and Processes, adapted to Mining, Metallurgical, Railway, Engineering and other Industrial Purposes.

### AN ELECTRICAL ROCK DRILL.

ELECTRICITY may be said to have its home in the United States, for there it is carried to its highest perfection and applied in the greatest utility. Upon that account it is not surprising to hear of an electrical percussion drill working in several of the American mines.

Proposals to utilise electricity for this purpose have long been before the General Electrical Company of New York, and the result is the production of a new rotary rock drill. Success in no usual degree is claimed for the invention, and speaking of it the originators say:—"The plant has aroused widespread interest among quarry operators in general, and has been visited and carefully inspected by many of those less prone to reject the improvements which advanced science offers. That electricity is the ideal power for mine and quarry operations, only the most conservative now refuse to believe."

At the present time three of the General Electric Company's drills are in continuous operation 10 hours per day, drilling holes from 6 to 10 feet in depth, and 2 to 2½ inches in diameter at the top. The rate of drilling, according to the record kept by the superintendent, is from 40 to 75 feet per 10 hours, averaging 50 feet per day, or 1500 feet per month of 30 days. The average distance of the drills from the power station is about 2000 feet at the present time, the circuit, three lines of copper wire, being extended to a distance of 3000 to 3500 feet from the power station in one direction.

The manipulation of the drill is in every respect as simple as that of the steam or air drill, stopping and starting being accomplished by merely throwing a handle to the right or to the left, making or breaking the contact between the cable and the terminals of the coils. Not the slightest difficulty is experienced in lubricating the wearing parts or in handling the drill. The general dimensions of the "Type E" drills, three of which are doing all the deep hole drilling for the quarry, are:—Length over all 49 inches; outside diameter, wrought iron tube, 7½ inches; length of stroke, 5 to 7 inches; blows per minute, 380. The generator which supplies the power is of the bipolar type, running at normal speed, and is provided with a device for directing the current alternately into the upper and lower coils of the drills. The difference of potential at the fixed brushes of the generator is 240 to 250 volts. The generator is bolted to a 9 inch by 12 inch straight line engine supplied with steam at 90 lbs. pressure from a horizontal tubular boiler, fuel for which is brought for three miles over the cable way in the buckets used to transport the lime rock from the quarry to the works. As yet no estimate of cost of repairs can be given because up to date there have not been any. Should, however, any part break down it can instantly be replaced as all the parts are interchangeable.

The conservatism characterising the English mining industry is not of that kind which persistently refuses to adopt an innovation, palpably advantageous. No doubt, therefore, the new electrical rock drill, described in the foregoing paragraphs, will receive the attention of the more enterprising members of the profession and be judged fairly upon its merits.

DIAMONDS IN SOUTH AUSTRALIA.—The Australian Mining Standard states: A country long believed to be rich in gem stones is the northern portion of South Australia; and the belief is supported by the news received this week to the effect that a digger named Gardner at Mount Kingston, has forwarded to the Government geologist a diamond weighing a little over one carat, which he says he found when panning for gold. It is a perfect crystal, with curved faces, and slightly tinged with yellow. Mr. G. S. Streeter, son of Mr. E. W. Streeter, the gem expert of London, is visiting Australia. At present he is in Bingara, in company with Mr. Dowell, M.P., and purposes inspecting the diamond mines.

## THE MINERAL WEALTH OF HUELVA.

Being an Illustrated Article on the History of this District from the earliest times.

[Specially written for *The Mining Journal*.]

### III.

(Continued from page 171).

#### Relics of Egyptian Culture.

THE extraordinary fact of finding near Yecla, some 50 kilometers inland from Alicante, an enormous number of stone statues representative of undoubted ancient Egyptian culture, can only be attributed to a large, important, and permanent settlement of Phoenicians, who would have acquired this culture through their constant commercial intercourse with the land of the Pharaohs. Many of these statues can now be seen in the Archaeological Museum of Madrid, and they represent such objects as Osiris, Isis, with her son Horus sitting on her knee, several priestesses to various gods, a priest of Isis, &c. They are of different heights, some being only 2 feet, whilst others are 6 feet high, thus proving that they must have belonged to a permanent settlement.

This, then, is without doubt the period in which the mines of the district of Huelva were first worked by Phoenicians, and although the sources of information at our disposal are scanty, so far as this special point is concerned, and vary among themselves, yet we will make an endeavour to fix its date approximately. According to Josephus (Book 8 antiq. Cap. 3) the Phoenicians were installed in Spain 240 years before the building of Solomon's Temple. This places them there at about 1240 B.C. Strabo, speculating on the probability of Homer being not unfamiliar with Tartessus (Andalucia) and Gades (Cadiz), says that the Phoenicians were the discoverers of these countries, for they already possessed the better parts of Iberia and Lybia before the time of Homer. This statement does not fix any precise date, but it enables us to say that some time previous to 950 B.C. the Phoenicians had become masters of the district of Huelva and no doubt spread themselves out along the coasts of the Mediterranean.

The writer of the article "Phoenicia," in the Encyclopedia Britannica, says "Gades (Cadiz) was founded a few years before Utic, a Phoenician town near Carthage, which again is known to have been founded in 1101." So according to this source it may be said that about 1150 B.C. the Phoenicians started their connection with Huelva.

When the Israelites, under the captaincy of Joshua, entered the promised land after their 40 years of dreary wanderings, they came from the East, driving the former occupiers of the land of Canaan before them, and taking possession of no fewer than 31 kingdoms. The result of Joshua's triumphs must have been to press out of the land, towards Egypt and towards Sidon and Tyre, a large population possessing now no country or home. They could not all be accommodated in the strange countries where they sought refuge, so a migration of no ordinary nature must have taken place, and it is known that for many centuries whole tribes on the north coast of Africa attributed their origin to this forced emigration from the land of Canaan.

The following is an extract from a work called "The Book of the Generation from Adam," supposed to have been written by Hippolitus, an ecclesiastical writer of great fame. (225 A.D.):—"The islands which belong to the Tarragona district of Spain are three in number, and are called Baleario. They have five cities—Ebusus (Ibiza), Palma, Pollentia (Pollenza), which is called Majorca, Tomoene, and Magone (Mahon), which is called Minorca. Their inhabitants were fugitive Canaanites flying before Jesus, the son of Nave. Those who founded Sidonia (Medina Sidonia in the province of Cadiz) were also Canaanites. The Jebusites founded Cadiz (Cadiz), they being likewise fugitives."

#### Phoenician Emigration.

Here we have most distinct indications of a Phoenician migration to the south-west of Spain, after the irruption of the Israelites over the Land of Canaan. Curiously enough, a part of this story seems at variance with the details in the Bible, for the 63rd verse of the 15th chapter of Joshua says:—"As for the

Jebusites, the inhabitants of Jerusalem, the children of Judah could not drive them out; but the Jebusites dwell with the children of Judah at Jerusalem unto this day." This variance is in itself an indirect proof that the statement as written was the received history at the time of writing by at least some large proportion of the educated community, for had this not been so, the writer would assuredly have made himself agree with the Holy writ. On the other hand it is possible that only that portion of the Jebusites who absolutely inhabited Jerusalem continued to dwell there, and that other portions emigrated.

Saint Augustine, admittedly the greatest of the four fathers of the church, and a native of the north coast of Africa, assures us that the country people in certain parts there during his time (400 A.D.) called themselves Canaanites.

Procopius, who accompanied Belisarius in his African war against the Vandals (553 A.D.), and afterwards wrote its history, makes the following statement:—"The Phoenicians not being able to keep back the invaders (the Israelites), emigrated to Egypt, but finding no place wherein to dwell, they entered Lybia, all of which they occupied, reaching even to the Pillars of Hercules (Straits of Gibraltar). In Tingis (Tangier) they raised two columns of white marble, on which they wrote, 'We are those who have fled before Jesus, son of Nave.'

As will afterwards be seen, a similar sentence had been transcribed 80 years or more previously from a contemporary writer by Moses of Chorœne in his history of Armenia. It gives the further information that the inscription was actually in existence at that time, 450 A.D.

Knowing, as we do, that the Phoenicians were the most eminent navigators and the most fearless adventurers of antiquity, nothing is easier to imagine than that the expelled Canaanites flying before Joshua would emigrate to what was then the remotest part of the earth; and if the North Coast of Africa and the South West of Spain were already known to their countrymen, with all the more reason then would they betake themselves there. We are acquainted with dozens of such migrations in relatively modern times, and the special peculiarities of this ancient one lend it more than an appearance of likelihood. If accepted, then, it would be the first historical record of Phoenician intercourse with the South West of Spain, and its date is generally fixed at about 1450 B.C.

#### Probable Period of their Exploitation.

Having found four dates to choose from—namely, before 950 B.C., 115 B.C., 1240 B.C., and 1450 B.C.—the generally accepted views as to the extremely early development of Phoenician trade would warrant the selection of the oldest one as that which would more nearly represent the commencement of their communication with the district of Huelva. However, so as not to err in the direction of exaggeration, it may be well to state simply that there are strong reasons for believing that the Phoenicians were trading in the district of Huelva 1200 years before the Christian era. That their exploitation of the mines was commenced immediately after the toleration of their presence by the natives of the country may of course be accepted, for, being avaricious traders, the Phoenicians wanted riches, and riches were most quickly collected from mines.

#### The Duration of their Influence.

We next have to consider the length of time that their influence or domination lasted in the particular part of the Iberian Peninsula with which we are dealing. It is now a matter of common knowledge that the ancient Assyrian Monarchs early adopted a system of chronicling the events of its history, and for the latest centuries of its existence these chronicles are fairly complete. From these sources, from the ancient historians, and from the Biblical writings, we know that the Assyrian monarchs were constantly over-running the country of the Jews and the Phoenicians between the years 750 B.C. and 650 B.C.

In this epoch we find Tiglath-Pileser disposing of the throne of Samaria, and obliging Judah to become tributary to Assyria. Shalmaneser continued the war in Samaria, but that town was not captured till the reign of his successor, Sargon, when the whole of Syria and Palestine were reduced to vassalage, including the town of Tyre, which had undergone a siege of five years. The next Monarch, Sennacherib, was obliged to renew the incursions into this country, and early in his campaign Tyre and Sidon were again captured. This is generally supposed to have taken place in 701 B.C., but further revolts and chastisements took place as late as 650 B.C.

(To be continued.)

## SPECIAL CORRESPONDENCE: COLONIAL AND FOREIGN.

### MINING IN ASTURIAS (SPAIN).

#### GOLD MINES OF THE ANCIENTS.

(FROM OUR OWN CORRESPONDENT.)

GIJON, 16th February, 1894.

THE Cambrian zone lying between the rivers Navia and Cangas, is notable for the immense belt of quartzite that passes from the sea, on the north, through the whole province, interning in the province of Leon on the south. This, on its eastern side, is accompanied by a thin band of limestone, saccharoidal in the vicinity of eruptive masses.

Without entering into full details respecting this, it will in some instances be mentioned in connection with the ancient workings that dot the country. The eruptive masses have in many instances induced the metamorphism of the adjacent strata, to a greater extent than was met with in the case of the masses farther west, and are worthy of particularisation.

Between Salime and Pola de Allende, and about six leagues to the south of the town of Navia, near the village of Lago, (altitude about 800 metres above sea level), there is a mass of feldspathic diorite, about 200 metres wide. This has not affected the adjacent stratified beds, which are comprised of chloritic schists and to the south, south-south-east, and east of this there is a run of common diorite in the vicinity of which (near the banks of the River Valledor), there are several ancient workings for gold.

At Pola de Allende there is a mass of granite 3 kilometres long by 1 broad. There is little alteration on the northern side, the schists for over a league being very chloritic with veins of chlorite, and quartz having crystals of this. South-south-east of this the schist for 3 kilometres has been transformed into gneiss and mica schist. This can be seen near the village of San Martin. A league south-east of Pola de Allende, near the village of Celon, adjoining a lode of diorite, there is one of porphyry and some granite. North of this there is a lode of granite which in some places is porphyroid. This is distant half a league east from the Pola de Allende group. Here, between the two groups, the schist is altered—first to gneiss then to mica schist, afterwards talcose and twisted, sometimes fibrous, generally of a whitish colour, and very lustrous, often a pearly white. In these, near the village of Figueras, there are some ancient workings, and in the pearly-white schist there are thin veins of true asbestos, having a good fibre, to be worked at some future day.

#### BAY OF BISCUAY



At Iboyo, under the saccharoidal limestone, there are some ancient workings in hard porphyritic diorite.

At Collada, between Pola de Allende and Navegas, there is a lode of diorite, and near it—converted into saccharoidal gypsum, the limestone corresponding like that of Iboyo, to the band lying conformably with the great quartzite belt. This gypsum is unique in the ancient formations of Asturias and Galicia.

At Rengos, three leagues south-south-west of Cangas de Tineo, there is a continuation of the limestone band. The cave of Sequeros in this is beautifully adorned with stalactites. The limestone here has been metamorphosed into marble, white like Carrara, light rose colour and green. The want of ways of communication has prevented the exploration of these up to the present.

The proportion of limestones to that of schist and quartzite combined, of the Cambrian series in this province, is in the ratio of 1 to 150. The eastern margin of the great quartzite zone marks the greatest development of the ancient working. These form a string from Vegalagar, 2 leagues south-west of Cangas de Tineo, for a distance of 8 leagues, to near Trevias. All these had their canals to bring the water, often long distances above the level of the workings; these canals were made along the irregular sides of the mountains, and show to-day that the engineering skill of those ancient miners was well up to the mark.

Some of these workings have two or more canals, from different watersheds, so that when on one side the supply was insufficient they soon went in a contrary direction for a further supply. There are several cases where they tunneled through an intervening ridge, to get their water through after bringing it from a long distance. Such is the case at Montofurado, where the water was required for the working of the mine, which to day is known as the "Cueva de Juan Rata," celebrated in the folk-lore of the country. A tradition has been carried down "that this cave holds an enormous treasure, and to obtain it a passage has to be made through a gallery closed by an enormous door. It

is so guarded by 'Janas' (the antique gnomes of the miners of the Hartz mountains) that any who may find their way in will never come out again, but will be compelled to join in a Macabrean dance, terminating in madness and death."

Notwithstanding all this, many years ago some of the country people, overcome by their cupidity, joined together to lay bare this treasure in spite of the attempts of their spiritual advisers to dissuade them. They commenced work, and for a few days all went on "as merry as a marriage bell," but their ignorance of the rudiments of mining brought the roof about their heads, and they were buried under the ruins they had brought upon themselves. They were looked upon as apostates, condemned, and left where they had fallen. No further attempt has been made to reach the treasure. The basis of the tradition will be found, in all probability, in the rich lode awaiting explorers. That would have yielded vast wealth to the ancients, and would remain in sight when these left off working. Nothing can be seen to-day to show what or how they worked beyond the immense attle bank and the gold found in the stream draining this.

A number of these ancient workings are on the banks of the River Ouro, which, before it falls into the Navia, has its name changed to Lor, the former being the local name for gold, and both originating from the same word—oro gold. The country people pan this river, getting fair results in their crude operations. Their pans are roughly cut out of blocks of wood, and are called in the locality *maseiros*. The gold they find in these streams is coarse, and in quality fine, and in all probability proceeds, for the most part, from the immense attle banks of the ancients, carried into the streams by the winter torrents washing them gradually away. The attle from the Cueva de Juan Rata is washed into the river Castelo, another tributary of the Navia.

As a rule there are no bodies of alluvion, as the rivers run in deep narrow beds between precipitous sides, but where the Navia has widened out its bed, in softer bodies of rock, and where it bends at sharp angles across these beds, when the water is low in summer, washing has been carried on from time immemorial by the peasants, and successful results have been obtained.

One of these bends have been carefully prospected by the writer, and proves that a systematic clean-out to the bed-rock, and of the interstices between the layers of schist, pitched against the river flow, would yield enormous results.

This spot has been pointed out to the writer's guide (an old miner), who during his youth had accompanied Schulz in his researches through the province, when he was preparing his geological map, and writing the descriptive geology of the province. This favourite *peón's* attention had been called to it by Schulz, and as soon as he was at liberty he returned to his village, sold a couple of heifers, and with the proceeds of the sale went to work. He formed a bank of brushwood and dirt to dry a portion of the bed, then he cleaned off a part of the surface rubble, and got down to a clay thickly studded with gold. He was only permitted to take out a very small spot of this, as his defence was destroyed by the rising river, resulting from a succession of thunder storms. He tried again, with the same result, and his funds being exhausted he had to yield to the force of circumstances. He secured, however, over 4 ounces of gold in his small attempt. At the time of our visit he pointed out where and how he had obtained the gold, and an effort was made to do as he had done. The bank was made, and the bed dried; the top was removed, and the clay laid bare by the time night had come, and a specimen obtained. An anxious night was passed, and at day dawn we were on the spot, but the river had risen over a foot, and had washed away all trace of the yesterday's work. Another attempt was made, with the same result, and it was given up, with an intention of returning at some future day (which has not yet arrived), with a sufficient supply of hydraulic lime to cut the river off in form, and so lay bare an area of about 1600 square metres as a first section.

These thunder storms cause the river to rise very suddenly from 3 to 5 feet, so that with a wall of 6 feet, there would rarely be flooding in summer, and as the wall would be in the form of a pier, the water would of course empty as fast as it got in.

Portions of the banks prospected above the river level, the washing of the soil accumulated about the roots of moss and heather growing on the rocky sides, together with the sample of the clay yielded slightly over two ounces of coarse gold, some grains being of the size of wheat.

## OBITUARY.

### DEATH OF MR. THOMAS NEWBIGGING.

It is with deep regret that we have to record the death of Mr. Thomas Newbigging, the resident manager at the Leadhills Mines, which took place on the 11th inst. at the age of 62. Mr. Newbigging had been associated with Leadhills for over half a century, having begun work at the mines when only nine years of age. In 1887 he was appointed resident manager. He was a man of great energy and determination, and it may be stated as an example of this that quite recently under his supervision two shafts were sunk a depth of 15 fathoms each in less than three months—a feat, perhaps, unequalled in the annals of British metalliferous mining. Mr. Newbigging's aptitude for business, his genial manners, and the sympathetic interest he took in the welfare of the miners and villagers rendered him highly popular in the district, and only 18 months ago he was the recipient of a very handsome testimonial from the people of Leadhills. He had been 15 years a member of the School Board, and presided over it for six years. The funeral was largely attended, and many wreaths and flowers sent by the company, Mr. and Mrs. Peter Watson, and others, covered the coffin.

**PRUSSIAN RAILWAYS**—In Wednesday's sitting of the Lower House of the Prussian Diet, several motions relating to the repeal of the sliding scale tariffs in force on the Prussian railways came on for discussion. The Minister of Railways read a statement to the effect that the Prussian Government was prepared to thoroughly examine the matter, and with that object had summoned the Provincial Railway Board to meet on the 6th prox., and the committee of that board on 3rd March. The motions were thereupon withdrawn, but were subsequently again brought forward by Herr Biehler, the Radical Leader, with the object of raising a debate. Finally, the House decided to remove them from the order of the day.

**SELL'S DIRECTORY OF REGISTERED TELEGRAPHIC ADDRESSES**—Mr. Henry Sell has not stopped at the compilation of the *Prussian* Directory, which has brought him a good deal of fame. Besides many minor works, he has brought out a directory of telegraphic addresses, and the work now makes its appearance in a greatly improved and enlarged form. The task of getting the information out of the Post Office has been one of immense difficulty, accomplished only by recourse to what is aptly known as "stick." To speak of the utility of the work and of the expense which it will of necessity save to those large firms who are in constant telegraphic communication with each other, would be the needless elaboration of a truism. The publication will work its way by sheer force of utility into the offices of all the merchant princes in the country.

## THE GOLD FIELDS OF WESTERN AUSTRALIA.

### INTERVIEW WITH ALBERT F. CALVERT, F.R.G.S.

The Past, the Present, and the Future of the Colony.

ALTHOUGH the announcement of a record output for the Randt has brought that wealthiest of mining districts into prominence, and has sent a wave of excitement among the *habitués* of Throgmorton-street, the westernmost of our Australian colonies continues steadily to maintain its position in the public favour, and to attract the attention of the more cautious and far-seeing among investors. Western Australia has one great advantage over all competitors. The extent of its riches is still unknown. About the Randt and its mines one can speak with the approximate certainty attaching to a well-developed territory. The demarcation of its reefs and the richness of its ore are set out clearly enough in the hundred and one books written about the district. After the subsidence of the phenomenal boom which carried the Randt so far into the confidence of the speculator, there remained a certain thoughtfulness and caution in the attitude of the South African adventurer that militated in the long run strongly enough against the reputation of the colony. With Western Australia the advance has been more slow, and with greater certainty of foot. Since the initial discovery of gold in the island-continent there has been no concerted beating of the company-promoter's drum. Isolated performances, some even possessing the volume and sound of a quartette, there have been; but no general beating, rising into the dignity of a grand tattoo, has been dinned into the financier's ear. It is natural to regard with greater confidence the slow forward movement of a rich and, as yet, undeveloped colony than would be aroused had it gained its celebrity with an impetuous rush.



ALBERT F. CALVERT, F.R.G.S.

The connection of the three generations of Calverts with the rise of Western Australia in the public estimation has been more or less a close one. The part which the two older gentlemen took in the opening up of the country has already been made sufficiently the property of the public to forestall any account of it here.

Albert Calvert, whose portrait appears above, passed his boyhood in an atmosphere of travellers' lore and mining jargon; and he early learnt to distinguish between his own cradle and that of the gold digger. Having by inheritance and training acquired a relish for mineralogy and a taste for travel, Mr. Calvert is regarded as an authority on all mining questions, and more particularly those connected with Western Australia. Much of his life has been spent in the colony, and upon his frequent visits to this country he generally takes occasion to call at Finch-lane for a friendly chat upon the position and prospects of the country to which he has devoted so much attention.

"The colony," said he, as he sat in our offices recently, "needs capital and population for the development of her vast area. Dampier said it was the most miserable place he had ever set foot in. After the Swan River settlement came a period of mismanagement. The transportation of convicts to her shores gave the colony a bad name, and did her much harm. Within the last seven years, however, her auriferous wealth has become more and more apparent; besides which she is rich in other minerals."

"Dearth of water on the gold fields is, I presume, as serious a drawback as either want of capital or want of miners?"

"In a sense, yes; but capital itself will soon overcome that difficulty."

"How so?"

"By conserving the rainfall in properly constructed dams and tapping the underground reservoirs."

"You are satisfied, then, that Western Australia is pretty abundantly supplied with subterranean streams?"

"Upon that point there can hardly remain any doubt. One of the most notable features of the country, as everybody knows, is the absence of rivers and surface waters. The mere fact of a scanty and intermittent rainfall does not account for this. Such water as does fall from the clouds is amply sufficient to supply numerous lakes and rivers. But the geological structure of the colony presents a porous surface quite unfavourable to the retention of water. Since evaporation only accounts for a fraction of the rainfall, we are driven to the conclusion that the water, in seeking its level, is received into great underground reservoirs wherever impermeable rock favours its retention. Thus both the geological and meteorological conditions indicate that artesian wells will help to solve the water problem."

"Do the Government contemplate taking the matter up?"

"They are already doing so, and have appointed a Superintendent of Water Supply; but we have most instructive examples in the other colonies. For instance, at the Buckalow Station, near the Stanley Range, close to the boundary between New South Wales and South Australia, a copious flow was obtained at 100 feet deep; the Sapley Downs No. 2 bore in Queensland has struck water at a depth of 543 feet and the flow is estimated at 1,000,000 gallons daily. In the same colony the Para No. 3 has

a depth of 2100 feet, with a flow of 220,000 gallons daily, and Richardson No 1 yields 1,000,000 daily from a depth of 740 feet. Again, on the Ninety Mile desert, crossed by the Inter-Colonial Railway from Adelaide to Victoria, water was obtained so far back as 1886, and still flows above the surface. The South Australian Government have been pushing matters forward in this respect, and have 10 drills in constant use capable of boring holes from 3 to 13 inches in diameter and to a depth of 3000 feet."

"Will quartz mining pay, do you think, as a regular industry?"

"It is bound to pay if conducted in a competent business-like fashion. Without science, without skill, without economic treatment of ores, it will not pay. No technical industry can be expected to pay when the primary conditions of success are absent. A run of luck may attend a gold mine for a time; but it cannot be permanently profitable unless under efficient management. Because in days gone by all sorts and conditions of men flocked to the alluvial diggings, people seem to have acquired the idea that any boy can be a gold miner. Then when mining companies are floated in England the directors are generally quite ignorant of the first principles of quartz mining. Some man who calls himself a mining expert is appointed to take charge, who adopts an altogether wrong process of manipulation. An expensive plant is sent out—batteries, tables, and what not. Perhaps quicksilver is used in treatment; but the gold is not clean enough and refuses to amalgamate; or, possibly, a coating of sulphur covers the golden particles, so that the mercury is altogether at fault. I need not multiply cases, however. Apply the same care and skill to a gold mine that you would apply to a brewery, and it will pay. It stands to reason that no business concern will run itself, or can be run on false principles."

"Do you not intend, by the way, to introduce an improved process for the extraction of gold from the mountain masses?"

"That is so. There is an immense amount of waste by the present systems, which are more or less dependent on the presence of gold in a native state. Consequently, a few hundred tons of ore are dealt with, while thousands are thrown on the dumps, or left standing. I hope to be able to do away with this wasteful procedure, and to show that the whole of the ore from wall to wall may be profitably treated. It is the neglect of such obvious means of saving the metal which raises the question: 'Will quartz mining pay?'"

"What do you think of the present outlook for the West Australian Gold Fields?"

"The prospect is simply magnificent. In spite of stupendous difficulties, her auriferous wealth has been abundantly proved from Kimberley in the north to Dundas Hills in the south. The Government well know how much depends on the development of the goldfields, and are determined to obviate the water difficulty. Legislation, where necessary, will be modified. Railways and telegraph systems are being established. In this country West Australian news is being eagerly demanded, and literature dealing with the colony is meeting with increased favour. Capitalists, engineers, miners, farmers, artisans and labourers are being attracted by the more and more favourable reports of the once neglected country. Even the astute General Booth, who is generally credited with keeping his weather eye open, has almost decided on selecting a large territory for the settlement of his over-sea colony."

"Which of the goldfields do you consider the richest?"

"Wait till they are all in full swing, and then I shall have something to go upon. At the present moment, Coolgardie has shown the most phenomenal yields, and at this rate of going is first favourite. But there may be richer reefs than Bayley's in any of the other fields, Murchison for instance. A few millions of men and a few millions of British sovereigns would make a vast difference in the surface of Western Australia. To attempt at this stage to select the richest district would be as hard as to pick out from a crowd of schoolboys a painter, a poet, or a prime minister."

"That is reasonable. But now and then we read about satisfactory crushings, and so forth, on fields of which the English public know next to nothing. Dundas for instance; what do you think of that?"

"Well, I may say that personally I know less of Dundas than of any other of the fields, having only paid it a flying visit; but it would not surprise me were it to come well to the front later on this year. It is very favourably situated in many respects. What we have to guard against is too readily accepting favourable reports about it. It would so well suit the good people of Esperance Bay and Albany to find Dundas turning up trumps, that one must not lend too quick an ear to accounts emanating from the extreme south of the colony. Kimberley suffers from what, for the want of a proper word to express my meaning in, I will venture to call far-off-ed-ness. Suspicious people might suspect Dundas of too-near-ed-ness to interested people. It is comparatively easily accessible to South Australians, who are usually credited in Perth with the capacity for being able to see a church by daylight."

"I suppose you do not take a very lively interest in the political life of Western Australia, Mr. Calvert?"

"To that I must answer 'yes' and 'no.' Without troubling my head about the details of party, I am firmly convinced that the immediate future of the colony is bound up in the standing or falling of the Forrest Ministry. The present Premier and his colleagues represent all that is go-ahead in the country, and it would be, in my opinion, a bad day, for outside investors at all events, were the gentlemen of what is called the Opposition to be returned next May. Further than that I take no interest in the politics of Westralia, and indeed from all I hear, I think the chances of any disturbances of the men in power so remote as to render it a waste of time to discuss them."

"We understand that you are about to give the public a most desirable and important work for the practical miner—viz., a book which shall amalgamate the science of mineralogy with practical mining."

"I have long since observed the want of such a work, and although my engagements will hardly allow me the time to devote to it, I intend to do my best to produce such a necessary book."

"With these words Mr. Calvert, having half-a-dozen important affairs in hand, rose, and shortly afterwards our interview terminated."

**PROGRESS OF THE BASIC STEEL PROCESS.**—Official figures available this week show that the total make of steel and ingot iron from phosphoric pig iron during last year amounted to 3,638,556 tons, being an increase over the make for 1892 of 435,916 tons. Of this total the basic Bessemer method produced 2,908,241 tons and the basic open hearth principle 830,315 tons. Of the steel containing under 17 per cent. of carbon the basic Bessemer out-turn was 2,904,881 tons, and the basic open hearth 596,716 tons. Of slag 274,000 tons were produced with the steel, containing about 36 per cent. of phosphate of lime, nearly the whole of which was used as a fertiliser. The makes of the various countries for the year are:—

	1893.	1892.
	With under	With under
Total.	17 p.c.	17 p.c.
England	550,036	503,445
Germany and Luxembourg	2,314,752	1,971,441
Austria and Hungary	314,937	220,397
France	382,017	243,283
Belgium, Russia, & U.S.A.	257,757	183,491
		3,638,556
	2,901,597	3,102,640
		2,471,992

## THE CHOICE OF CONCENTRATION MACHINERY.

By E. HENRY DAVIES, M.E., F.G.S.  
Author of "Machinery for Metalliferous Mines."

### II.

THE selection of the actual machinery for the treatment of any given ore cannot be decided upon by means of a definite hard and fast rule. Not only do most ores necessitate some modification of the existing process in order to achieve the best result, but it may also happen that an ore can be equally well treated by two different methods, and in this case the choice must be made according to local conditions, which may weigh more in favour of one type than another.

In mines of phenomenal richness it sometimes happens that the ore is so rich and abundant that it can be shipped direct to the market as it comes from the workings. Unfortunately, these cases are rare at present, although centuries ago, before the art of concentration was discovered, only those mines were worked which would yield an ore fit for smelting without undergoing any preparatory treatment. Many mines of this class, abandoned by the ancients because of the exhaustion of the rich pockets or of difficulties with water, have been successfully reopened in our own days, and have been doubly profitable, as not only could the ore be concentrated, but also the heaps of tailings and rubbish thrown away as valueless by the former workers.

As a general rule, however, some form of machinery must be used for the mechanical preparation of the ore, involving, first, the crushing of the mineral and afterwards the separation of the rich particles from the accompanying gangue by some process of concentration. We are therefore met at the outset by the question "to what extent must the crushing be pushed?" for it is evident that this operation must be only sufficient to detach the rich ore from the sterile gangue, as if carried beyond this point it not only renders the process of concentration more difficult, but also largely increases the attendant loss.

Roughly, all ores can be divided into two classes, viz., those that can be enriched by means of coarse crushing and concentration, and those requiring fine crushing and fine concentration. Among this latter class gold and silver ores are included, as they must be reduced to a pulp before they can be treated—first, over amalgamated plates or in pans, and afterwards on some form of vanner or other concentration table.

The process of coarse concentration consists in gradually reducing the size of the mineral, and after each reduction extracting the rich particles of ore by means of jiggers, then re-crushing the ore still carrying mineral until the whole of the latter is recovered.

A mill of this class for the concentration of galena, blonde, copper pyrites, and other ores would consist of a stone crusher of the Blake type, followed by a picking table, where the rich lumps of ore and the barren pieces of rock are sorted out, the former going direct into the magazine, and the latter to the waste heap.

The remainder of the ore reduced by the amount thus picked out passes on to a large pair of rollers, and after being crushed is classified by means of a series of revolving trommels, each of which feeds a jigger arranged for treating that particular size of ore. The number of sizes into which the ore is classified by means of trommels varies with its nature from six to eight. Each separate size goes direct to one or more jiggers according to the quantity, and in those separated, in the case of an ore carrying but one mineral into rich concentrates, middlings and steriles. If, however, the ore carries two minerals, say galena and blonde, then the product of each jigger will be: rich, concentrated galena in the first compartment of the jigger, followed in the second by a mixed product of galena, blonde and gangue, in the third by rich concentrated blonde, and in the fourth by a mixed product of blonde and gangue.

The middlings in the first instance, and the mixed products in the second, as well as any tailings containing over 2 per cent. of lead, are sent back to be re-crushed, in order further to separate the mineral from the gangue.

The re-crushing is effected in a pair of rolls, or, more suitably, by means of two pairs kept for this purpose. If two pairs are used, then the coarse middlings should be sent to the rolls with the shells most worn and the fine tailings to the one with the newest shells. By this means a better result is obtained, for although theoretically, with a well distributed feed, the rolls ought not to wear unevenly, yet practically they will always be found to do so, and in consequence the fine ore escapes through the grooves in the shells without being re-crushed.

The recrushing rolls are followed by fine trommels feeding jiggers with fine sieves, while the ore under, say, one millimetre passes on with the water into an hydraulic classifier which distributes it amongst the slime jigs, slime tables, or Lührig vanners.

The degree to which it is profitable to push the recovery of slimes both in coarse and fine concentration depends not only upon the value of the ore but also on local conditions, such as labour, fuel, water supply, &c. For coarse concentration the rule should be to avoid making slimes by carefully regulating the crushing, never crushing a grain of ore unnecessarily, or filling up the stone breakers, rolls or stamps with material that does not need to be crushed. This can only be effected by a system of gradual reduction and a separation of the rich mineral at every step. By this means the capacity of the mill is increased, and the production of slimes materially diminished. It is with these latter that the bulk of the loss will occur, especially with brittle ores like those of silver and argentiferous galena, the rich slimes of which are readily carried away with the waste waters. Nor must it be forgotten that although the rich contents of the slimes can be profitably extracted while the whole is in motion, yet it will possibly not pay to attempt it, if once they are allowed to settle, thus involving the re-handling of the stuff.

An example of the perfection which can be obtained by coarse concentration we may quote the results obtained at a mill erected on the Lührig system at a mine near St. Goar on the Rhine, with a capacity of 50 tons per day. We quote this particular instance, as we know of mines in our own country with similar ores which, with the old system of concentration, can hardly make both ends meet, but which with modern machinery would, from a shareholder's point of view, yield much more satisfactory results.

The raw ore as it comes from the mine contains 9.26 per cent. Pb. and 18.90 per cent. Zn., while the concentrates average 64 to 65 per cent. for the galena, and 41 to 42 per cent. Zn. for the blonde. The loss in the tailings is under 1 per cent. Pb. and 2 per cent. Zn., while the total cost of the concentration including repairs and coal is 2s. per ton.

**Fine Concentration.**—It is difficult to draw a sharp boundary line between the processes or systems of fine and coarse concentration, as the latter is usually followed up by the former in order to save the last particle of valuable material.

At one time it might have been said with approximate truth

that coarse concentration ended with jiggling, but now, owing to the perfection which has been attained in the construction of jiggers, the fine ore which formerly went direct to fine concentration appliances is successfully treated on high speed percussion lever jiggers.

As we have already stated, the system of coarse concentration involves the gradual reduction of the ore by crushing in order to avoid the pulverisation of its mineral contents. Many ores, however, carry their valuable material so finely divided and mixed up with the gangue that the whole must be reduced to powder before the one can be freed from the other. It is evident therefore that the preliminary processes of coarse concentration are inapplicable in this case, and that those of fine concentration must be resorted to from the outset.

The rough ore as it leaves the mine is first of all broken down by means of a stone crusher and falls into a bin, from which it is automatically fed into a stamp battery or other form of pulveriser. We do not propose at this moment to discuss the very open question as to the best form of machine for the fine pulverisation of ore. So many appliances have been designed for this purpose that the patent records abound with them.

Few, however, have come into practical work, and these have been more or less successful with certain classes of ore. For all round work in wet crushing the stamp battery is the most successful machinery yet invented, while its simplicity and the ease with which it can be repaired and kept in working order without the use of special tools, and intricate castings are some of the many reasons which have helped to maintain its popularity amongst practical men.

After leaving the stamp battery the treatment of the ore depends upon its nature. If it is an ore containing free gold, it flows in in the form of pulp over a series of amalgamated copper plates, while if it contains silver in the form of native silver, chloride of silver, and certain forms of sulphide of silver it flows into a series of amalgamating pans. The waste waters from the plates and pans used in the above-mentioned processes still carry mineral which cannot be extracted by amalgamation, and these slimes must be treated by the process of fine concentration, as applied to ores which do not require amalgamation, such as those of tin, copper, antimony, galena, blonde, &c.

Whether the slimes are derived direct from the stamps, or are obtained after treatment over the plates or pans, they must first of all be classified by means of Spitzkasten pointed boxes or hydraulic classifiers. The makers of some concentrators assert that their machines will work on pulp or slimes direct from the stamps, but it may be taken as a general rule that all slimes must be classified previous to concentration, and that it is only by means of careful classification that anything approaching good results can be obtained.

The classified and thickened pulp from the Spitzkasten is fed on to a series of vanners either of the Lührig, Frue or Embrey type, according to the results required.

Formerly, as, indeed, is now commonly the case in the Cornish tin mines, percussion tables and round bubbles were exclusively employed for this purpose, entailing costly handling of the ore and great loss in the tailings; now, however, the great improvements recently made in concentrating machinery admit of a constant automatic delivery of the products. In the case of machines of the Frue vanner type these products are concentrates and tailings, as they do not admit of making any "middlings" or of treating mixed ores on the same table.

For this latter purpose the Lührig or the Bilharz table is most appropriate, and with either of these machines the products will be rich concentrates, middlings, and tailings. The middlings would be fed direct on to another machine placed at a lower level when the same division of the products would be obtained, although the quantity would be much less, owing to the abstraction of the concentrates and tailings on the first vanner.

As an example of the perfection of this type of concentrator when working upon South African gold ore containing 11 dwts. the machine made concentrates containing 12 ounces 12 dwts. 7 grains, the tailings carrying only 23 grains of gold. In another case on Australian tailings having 3 dwts. 5 grains of gold per ton, the results were, concentrates, 5 ounces 1 dwt. 22 grains, middlings, 1 dwt. 55 grains, and tailings with only traces of gold. The total yield was therefore 87.01 per cent. of the total gold.

The results were equally successful when treating silver or copper ores.

Our aim in this article has been to outline the processes of coarse and fine concentration and to indicate the results which may be fairly expected from the use of modern machinery, and now as a guide to the choice of a process we annex a statement in tabular form giving on general lines a scheme of treatment for most of the ores usually met with.

### SCHEMES OF CONCENTRATION.

Gold ores . . . .	Free milling if the ore is free from sulphides. Free milling followed by fine concentration, roasting, and chlorination, or cyanide or smelting for product if sulphides are present.
Silver ores . . . .	Free milling if the metal is native or chloride. If combined with sulphide, free milling followed by fine concentration and smelting.
Galena, blonde, zinc, carbonate, copper pyrites, &c. . . .	If low grade sulphide only, fine concentration and smelting. High grade roasting milling.
Carbonate and oxide of lead or copper . . . .	If the mineral occurs in large crystals, coarse concentration and smelting.
Antimony ores . . . .	If finely disseminated, fine concentration and smelting.
Tin . . . .	The rich lumps of ore to be hand picked on revolving or belt tables.
	Smelting.
	Coarse or fine concentration according to character of ore.
	Fine concentration. In some alluvial deposits coarse concentration followed by fine can be used to advantage.

**THE ENGINEER'S YEAR-BOOK.**—The Engineer's Year-Book of engineering formulae, rules, tables, data and memoranda has just made its appearance in the usual neat form. As the author, Mr. H. R. Kempe, A.M.Inst.C.E., says in the preface, there is assuredly no profession which stands more in need of an encyclopaedic work of the kind than the engineering profession, and it may be added that their need could hardly be supplied in a more admirable, complete and convenient form than by the work before us. It covers nearly the whole of the various branches of knowledge to which the engineer needs to have access, and a professional man with some such work at his hand would be in an incomparably better position than one who depended solely upon his unaided memory. With so many excellent works of the kind in every branch of the industries and professions the publication of an additional one of the kind challenges the severest kind of criticism. To say of this work that it more than sustains all comparisons is praise of the highest sort, and that may justly be said of it. To have the book upon the shelves is a great advantage, to know its contents thoroughly would be a second professional education.

## NICKEL MINING IN NEW CALEDONIA.

PAPER BY MR. JOSEPH GARLAND.

**A**T the monthly meeting of the Institution of Mining and Metallurgy, held on Wednesday, at the Geological Museum, Jermyn-street, W., under the presidency of Professor HUNTINGDON, Mr. Joseph Garland read the following paper on "Nickel Mining in New Caledonia":—

The discovery of nickel ore in New Caledonia is by common consent due to M. Jules Garnier, who, when engaged in a geological survey of the island in 1864, met with the strange green mineral which was destined some years later to become one of the most important sources of nickel in the world. M. Garnier made known his discovery three years later in a memoir\* published in the *Annales des Mines* for 1867. It was not, however, till 1874 that the discovery became the object of serious attention. In that year the first attempt at mining the nickel ore was made at Mont d'Or, a conical and conspicuous peak a little to the south of Noumea, the capital.

At first there was a good deal of misconception as to the true nature of the mineral, and for a time its green colour gave rise to the belief that it was an ore of copper; and, indeed, a shipment was, it is said, made to a smelting works in Sydney to determine its value for copper. It is needless to say that the attempt to extract copper from the ore proved futile. It is not, however, the first time that an ore of nickel has been mistaken for copper ore, for it is well known that *Kupfernickel* was so called by the German miners because they frequently mistook it for an ore of copper. It is recorded that when the French colonists realised the importance of the discovery, the Government offices were daily besieged by applicants for concessions, and that the excitement became intense.

The deposits at Mont d'Or were found to be unremunerative, but it was not long before fresh discoveries were made in other parts of the southern half of the country along the east coast, and mining for nickel soon became an established industry. For the first few years the mines were worked solely by private enterprise, but in 1881 fresh impetus was given to the new industry by the starting of a big French company, La Société de Nickel, locally known as the Nickel Company, which, though not the only nickel mining company in the island, is far and away the most important. It has acquired mining rights over an immense area; it works a large number of mines under the direction of its own officers, and leases a large number of others; it is the purchaser of all the nickel ore raised in the island; has a monopoly of the shipment of the ore to Europe, and has, moreover, enormous influence in the country. It was for some years believed that the nickel-bearing formation was limited to the mountain ranges along the east coast, and it is along this coast that the chief mines are still being worked; but it is now an established fact that the magnesian rocks in which this metal occurs have a very wide extension also on the west coast, and a number of valuable mines are now being worked on that side of the island.

The author found during his recent visit that the eagerness to acquire nickel concessions, though not so keen as it is reported to have been formerly, has by no means died out, and that new grants are constantly being demanded from, and granted by, the Mining Department at Noumea. The production has now reached over 60,000 tons of nickel ore per annum, is still increasing, and it would appear as if nickel mining in this far off French colony (and penal settlement) were still in its infancy. From official statistics published at Noumea, and brought down to 1st July, 1892, the author gathered that the total number of mines at that date was 324 (of which about 80 were in active operation), comprising an area of 48,956 hectares, or, say, 120,921 acres.

### Geological.

It is not the object of this paper to discuss the general geology of the island; that would be outside the author's opportunities of study and personal observation, and, moreover, would not conduce to the elucidation of his subject. Broadly speaking, the southern half of the island, with which this paper deals, consists of serpentines and schists; but the former is the most prominent formation, and it is solely in this rock that the nickel deposits occur. It must not be understood that this rock is always and everywhere the repository of nickel—that is not so; but wherever the ore is found, it is invariably in the serpentine. This rock is the common massive variety, of variable colour, dark green and greenish grey being, perhaps, the predominating shades. It is sometimes traversed by veins of steatite, and often exposes steatitic faces, which have the smoothness and unctuous feel characteristic of soapstone; outcroppings of asbestos are also occasionally met with.

It is not, however, veined and mottled like, for instance, the serpentines of the lizard; indeed, the noble or precious serpentine was nowhere observed by the writer, though he travelled over a great extent of serpentine country; nor could he find, on enquiry, that any variety of the rock was ever used for decorative or ornamental purposes. The serpentines form whole mountain ranges running into peaks and ridges of considerable height; and it is a noteworthy fact (which the author will leave to the geologists present to explain) that the nickel deposits occur almost invariably in elevated positions, often at the very summits of the mountains. Indeed, a visit to a New Caledonian nickel mine, involving, more frequently than not, a climb up the very steep sides of a mountain some 600 to 1000 metres in height, in a tropical sun, is an experience well calculated to impress its novelty upon the mind of the visitor. As a general rule, the nickel-bearing summits are capped more or less extensively—sometimes very extensively—with ironstone. These deposits are often several feet in thickness, and consist of a confused mass of boulders and rounded pebbles, from the size of the largest cannon ball down to that of small shot; underlying the rounded lumps of hematite, and sometimes extending for some distance down the slopes, layers of oolitic gravel of the same material not infrequently occur. It is stated on good authority that the ironstone carries a little chromium to the extent of 4 to 8 per cent. of the sesquioxide,  $\text{Cr}_2\text{O}_3$ . The ironstone is much weathered, is quite black, and very vesicular.

Another conspicuous feature is the frequent occurrence on the serpentine slopes of a peculiar red earth, often in patches of considerable extent, and appearing from a distance like huge scars. It is generally spoken of as argillaceous ironstone, or ferruginous clay, but the author gathered from an excellent chemist on the spot, to whom he is indebted for the following analyses, that it contains no alumina, but consists almost entirely of iron and silica, with 1 to 3 per cent. of nickel, but having no commercial value. The analyses referred to are:—

	I.	II.
$\text{SiO}_2$	18.42	12.45
$\text{Fe}_2\text{O}_3$	69.30	66.36
$\text{Al}_2\text{O}_3$	0.45	—
$\text{NiO}$	1.64	3.14
$\text{H}_2\text{O}$	9.80	12.70
$\text{MgO}$ and $\text{MnO}$	0.39	5.35
100.00	100.00	

The nickel ores occur, as a general rule, in irregular veins and strings in the fissures and joints of the rock, ramifying in every direction and forming a stockwork or network of small veins. Occasionally they are met with as persistent veins extending some hundreds of feet in length and to a moderate depth, and in these cases partaking of some of the characteristics of a regular lode. Veins occur, for example, 2 to 3 feet in thickness, with good regular dip, and taking at times a lenticular form 4 or 5 feet in thickness. It is generally held, however, by the French engineers that these veins are not true fissure lodes. The lesser veins and stockworks could not be profitably worked by underground mining, and are invariably worked in open quarries.

\* "Essai sur La Géologie et les ressources Minérales de la Nouvelle-Calédonie." The country is extremely mountainous, the central chain, north to south attaining a height of 1700 metres (5576 feet) and averaging 500 metres (1640 feet) whilst the mountains along the coast are from 100 to 200 metres in height.

### Mineralogical.

The mineral in question is a hydrated silicate of nickel and magnesium. The arsenides and sulphides are not met with in New Caledonia. Of this double silicate there are two distinct varieties, the green and the brown. Some mineralogists recognise two varieties of the green ore, and, following Professor Liversidge, designate them Garnierite and Noumeite respectively; the term garnierite after Garnier, the discoverer of nickel ore in the island, and noumeite from Noumea, the capital within a few miles of which the first deposit was found. Describing garnierite, Liversidge says, in a paper read before the Royal Society of New South Wales in 1880: \* "It is at once distinguished from the more important mineral, noumeite, by its adherence to the tongue, and by its falling to pieces when immersed in water, and even when allowed to remain adherent to the tongue for a moment or so. . . . Apart from these characters there appears to be but little difference between the two varieties."

The author, after spending several weeks in the nickel district, visiting a number of the most important mines, and studying the deposits and the character of the mineral, ventures to doubt if there are any sufficient grounds for the distinction here drawn—a distinction without a difference, he is inclined to think, and one, he believes, never recognised by the mining engineers and chemists on the spot. Not only is there, in his opinion, no justification for the sub-division into garnierite and noumeite, but he is decidedly of opinion that it is only common justice to the discoverer to designate this mineral garnierite, understanding by that term the green silicate of nickel and magnesia, without reference to the various shades of colour it assumes, or to the percentage of nickel it may contain. This New Caledonian mineral is always found amorphous—never crystallised. It occurs in massive pieces, in botryoidal, mammillated, and occasionally in stalactitic forms and in brecciated masses. Imbedded in the mineral are often angular lumps of serpentine rock.

It varies greatly in hardness, sometimes being quite soft and brittle, crumbling between the fingers, and in other cases hard enough to be cut into shape and to take a fair polish. In colour there are very pale tints of green (which appear to be only silicate of magnesia with a mere dash of nickel, and of no value), apple greens, and on to a rich dark green—the darker greens being generally richer than the pale green ore. Its specific gravity is about 2.5. Its composition is very variable, and the fact that no two formulae that one finds in text books and museums scarcely ever agree, would seem to indicate that the chemists find it very difficult to determine its exact formula. Bauermaier describes it as an indefinite hydrated silicate of nickel and magnesia. Dana says it consists essentially of hydrated silicate of magnesium and nickel—perhaps  $\text{H}_2(\text{Ni}, \text{Mg})\text{SiO}_4 + \text{Aq}$ —but very variable in composition. As to its percentage composition, it varies very greatly. Liversidge gives 12 analyses of samples of different shades of colour from different parts of the island. Omitting the water and minor constituents, the author finds the average of these to be  $\text{SiO}_2$ , 44.75%;  $\text{NiO}$ , 19.73%;  $\text{MgO}$ , 15.25%. In the official Year Book for 1891, published by the Government of Noumea, it is stated that the richer mineral has sometimes the following composition: silica, 43; nickel, 26; magnesium, 13; iron, 3; water, 13.

As to the brown variety of the mineral, it has practically the same composition as the green ore, but is understood to contain a little more iron, a little less magnesia, and to be somewhat richer in nickel than the green ore. It is always spoken of in the district as "chocolate nickel" or "chocolat." This variety has not been so long as the other. The author may here venture to quote an extract from an article contributed by him in October, 1892, to the *Sydney Morning Herald*:—"The green mineral has been mined since 1874; but not till about 1887, or the following year, was it recognised that the brown variety was an ore of nickel, and seeing that it occurs in veins, joints, and fissures, traversing the serpentine rocks precisely in the same manner as the green ore, and often intimately mixed with it (though also occurring in separate veins), there is no doubt that prior to that date much valuable brown ore was, in ignorance of its worth, thrown away to the spoil heaps. The chocolate ore, like the green ore, varies very much in quality or nickel contents, there being a light brown and inferior ore, just as there is a light green and low grade ore; but, speaking roughly, the chocolate nickel is understood to be the richer of the two; and that this is a generally recognised fact is evidenced to any one who moves about the island for ever so short a time, by the eagerness with which a discovery of "chocolate" is hailed. There is a distinct similarity in the composition of the green and brown varieties, in that they are both hydrated silicates of nickel and magnesia, the brown containing a larger proportion of the peroxide of iron and less magnesia. Speaking generally, all the nickel mines of New Caledonia yield the green nickel ore, but in some mines but little of the brown ore is met with, while in others the chocolate variety forms quite a distinctive feature. In conclusion, as the term "chocolate nickel" has become grafted into the mining phraseology of the district, I would venture to suggest that a concise and distinctive mineralogical name for the brown hydrated silicate of nickel and magnesia, or chocolate nickel ore, would be "chocolat."

Through the courtesy of Mr. Arthur C. Claude, our excellent treasurer, the author is able to give an analysis of a specimen of the chocolate ore, which he submitted to him for examination. Mr. Claude writes:—

I may say that this particular ore consists chiefly of an almost intimate mixture of two minerals—viz., hydrated silicate of nickel and magnesia, and hydrated oxide of iron, the latter probably limonite. The specific gravity of this ore I find to be 3000, the presence of the limonite raising it above that of garnierite (hydrated silicate of nickel and magnesia). I send you three small specimen boxes containing a small piece of the ore in its original state as received by me, a small piece of the ore treated by dilute hydrochloric acid, which dissolved the limonite leaving the green mineral garnierite, and some of the ore treated by the same acid after the ore had been finely pulverised. The following is the composition of the chocolate nickel ore:—

Nickel.	12.25 per cent. = 9.64 per cent.
iron	32.20
Magnesia	3.07
Aluminia	3.62
Silica	34.80
Water, at 212° Fahr.	6.43
Water above 212° Fahr.	7.07
	99.44

Specific gravity... 3.000  
It may be of interest to mention that cobalt does not occur associated with the nickel ore in the island, but nickel is found with the cobalt ores.

### Mining.

The mode of working the deposits is either by tunnel mining or by open quarrying. The first-named method is adopted when the veins happen to be fairly persistent and of good width; the latter method when they are small—say less than from 6 to 12 inches—and when stockworks occur. It sometimes happens that both systems come into operation in different parts of the same deposit. For example, the larger veins are exploited by tunnels, and subsequently the cap or top of the peak is quarried for the sake of the numerous small veins. When underground mining is resorted to, the system followed is that universally practised in metal mining, and familiar to all mining men.

A series of tunnels or adit levels, one below another, are extended into the mountain along the vein, and connected in the usual way by winzes and rises for ventilation, and for convenience of stoping. An example may be cited. The mine is situated near the top of a steep mountain, close to the Bay of Nakety. The outcrop of the main vein at the summit is some 1300

feet above the sea. Large masses of loose ironstone cover the plateau. The vein has a regular strike, and has been followed into the mountain for some 100 metres; it is bounded by good walls, which have a dip of about 45 degrees; its normal width is 2 to 3 feet, but it is about double this in places. The enclosing rock is a dark green serpentine. The ore is of excellent quality, consisting of the green and brown varieties—garnierite and "chocolat" (if the latter term may be permitted)—in the same vein, the latter rather predominating, a fact of which the proprietor—a hearty, hospitable, and enthusiastic Frenchman—is naturally highly gratified. The workings had attained a depth of about 350 feet from the outcrop, and at the deepest point reached the vein was still 18 inches in width of rich ore. The mine had been at work for about two years on a very moderate scale, and had yielded 2500 tons of ore, averaging 7 per cent. of nickel.

Very brief mention may be made of another nickel mine visited by the author, where the bulk of the ore was raised by open quarrying, but where there was also some underground mining of a somewhat irregular kind. The veins, some of them several inches in thickness, were not persistent in any one direction, and thus it happened that after driving on a vein a few yards it might be cut off by a productive cross vein; the latter would then be followed right and left till another interruption occurred, or the vein became poor. A winze would then be sunk or a rise put up to prove the vein, and perhaps fresh levels driven in different directions from the bottom of the one or the top of the other; and thus the mine, to a visitor, seems to be a perfect labyrinth.

Quarrying is done in terraces from the top downwards, each terrace having a wide floor on which the rock is blasted down, and where the ore is prepared for market. Each quarry has a face of nearly vertical rock, say, of 10 to 15 metres in height, and a floor of, say, 20 to 40 metres in width. Deep holes are drilled by "jumpers" in the face of the quarry and blasted with dynamite. The rock being very jointed, it breaks down in large lumps or blocks, which have subsequently to be reduced by heavy hammers or shot holes to a convenient size for setting free the veins and strings of ore, and for easy removal of the dead rock in waggons or barrows. Roughly speaking, every joint and fissure of the rock is filled with ore, the veins thus ramifying in every direction varying in size from, say, a knife blade thickness up to 6 or more inches, but the smaller veins are the most common and numerous, and hence, to secure all the ore, it becomes necessary to blast down the whole mass of rock—this being the only way these stockworks can be worked at a profit. It should be mentioned that occasionally these small veins have a white filling of silicate of magnesia only.

The preparation of the ore for the market is of the simplest description. The crude ore having been reduced by spalling to a suitable size, a portion consisting of mixed ore and rock, is separated by cobbing, the cobbed ore being always of high grade. The remaining portion, consisting of the fine ore, a good deal mixed with stone, is all carefully collected and screened in hand sieves of  $\frac{1}{2}$  inch holes; the fine which passes through is not further treated; the coarse which remains in the sieve is hand picked, the useless stone being removed. The picked ore is now thrown with the fines and the cobbles, and the whole mixed together forms the marketable product.

As might be expected, the ore prepared in this crude way, by screening and hand separation without the aid of water, contains a large proportion of stone and dirt; but this is the system universally adopted throughout the nickel mining district, the difference in the specific gravity between the nickel ore and the country rock not being sufficient to make easy and economical separation by water practicable. The average quality of the ore shipped to Europe is 7 to 8 per cent. of metallic nickel. No ore of less than 6 per cent. is considered marketable, nor will the Nickel Company purchase ore of a lower grade. The cost of mining and preparing the ore is one which the author must pass over very cursorily. It naturally varies according to whether the deposits are mined or quarried; it is affected also materially by the distance inland, the height above the sea, and by the conditions of labour. The author has heard of cases where the cost was so low as 6s. per ton, and of other cases where it reached 40s. per ton.

As to the class of labour, it consists, in the main, of convicts and ex-convicts. Of the available convicts—i.e., those whom the Government can spare from the public works—the majority are employed by the Nickel Company. The ex-convicts, or *libérés*, are men whose term of enforced servitude has expired, and who are now free to move about the island as they please, but who are exiles for life. These men, who find no difficulty in getting employment, command a wage of about 5 francs per diem at the mines. The native Kanaker, who form the bulk of the inhabitants, seldom work in the mines if they can avoid it, and their wants being few, they manage to a great extent to live without work. Indeed, they are said to hold strong views as to the folly of work, and the stupidity of the white man who is addicted to it. The Government having made them all sober by Act of Parliament—no one being allowed under heavy penalties to sell them any beverage of an exciting nature—they have only to work a few days now and then to purchase tobacco, or to replenish their very scanty wardrobes. The scarcity of labour is one of the chief difficulties in connection with mining in New Caledonia, and Kanakers are imported from the neighbouring islands, and even Chinese and Japanese are sometimes imported in considerable numbers.

It is a novel and interesting experience to see a big mine or a series of quarries in full work, manned entirely by convicts, guarded by a number of warders all armed with revolvers. Some of the men drilling holes, others blasting with dynamite, some spalling, cobbing, screening, or hand picking, whilst others are tramping or wheeling away the waste rock. Some also are placing the ore in bags ready for transport down the mountain side, on cable lines or tramways, to the wharf for shipment. All is activity, but there is an absence of zest and cheerfulness in the performance of the task, for, naturally enough, the convict is not notorious for the energy and enthusiasm he throws into his work. At a group of four mines at Thio, owned by the Nickel Company, which the writer was courteously allowed to visit, 900 men were employed, 750 of whom were convicts, and 150 *libérés*. The latter are not employed at the same mines as the former. Seeing that the country is, as has been said, exceedingly mountainous, and that the nickel mines are invariably situated in the mountains, wire rope tramways are indispensable and are very much used for conveying the ore to the valley, and it is said that the cost of such an installation is not, as a rule, great. To give an example:—At one of the mines referred to, the tramway, which is double, and 600 metres in length (1968 feet), consisted of two steel cables of 1-inch diameter with hemp guide ropes, the load consisting of four bags of ore, weighing together about 500 lbs. The whole cost of the installation was said to be 5000 frs., or say £200. Single cable tramways are sometimes used for short distances. They are simple and inexpensive, but of limited application. A single wire rope is anchored at each end in the usual way. A tong forked stick takes the place of the palley; one leg of the fork is pierced with a hole, from which a stout wire, bent into a circular form to carry a bag of ore, hangs suspended. A number of these suspenders are kept ready for use.

When it is desired to send the ore down to the dépôt, one of the forked sticks is placed across the wire rope, a bag of ore is simply balanced (not fastened) in the wire loop, a push is given, and the load goes spinning down the cable at great speed to the terminus, where it bumps against a battery of filled bags and is then removed. Only one bag of ore is sent down at a time, but they are generally made to follow each other very quickly. If a load happens to stick fast in mid air another cargo is despatched with an extra push to dislodge it; this generally succeeds in inducing the truant to move on, but occasionally the concussion disturbs the balance of things and the bag falls to the ground, the contents being scattered by the impact. This is a rough and ready method of sending down ore from new points and almost inaccessible places; but it involves carrying up the empty bags and forked stick suspenders—if they may be so designated—to the working points on men's backs.

The author regrets that, owing to an entire discontinuance of

\* "Essai sur La Géologie et les ressources Minérales de la Nouvelle-Calédonie."  
† The country is extremely mountainous, the central chain, north to south attaining a height of 1700 metres (5576 feet) and averaging 500 metres (1640 feet) whilst the mountains along the coast are from 100 to 200 metres in height.

\*\* Notes upon some Minerals from New Caledonia," By A. Liversidge, Professor of Geology and Mineralogy in the University of Sydney.

smelting operations in the island, he had no opportunity during his recent visit\* to study the metallurgical side of the subject.

He gathered on enquiry that smelting of the nickel ores into matte had been attempted on two or three occasions, and that a few thousands of tons of matte, of 50 to 70 per cent. metallic nickel had been obtained; that coke (imported from Sydney) was the fuel used, the flux being gypsum, or its substitute, limestone and sulphur.

For some reason, however, smelting operations have been discontinued, and the ore is all sent to Europe; the bulk, if not the whole, it is understood, to Glasgow, to be metallurgically treated. In conclusion, it may be mentioned that the nickel deposits of New Caledonia are said to extend only to a limited depth, one formerly important mine having, it is reported, ceased to yield nickel at a depth of 300 feet, the ore at that depth passing into the white silicate of magnesia. The author has no evidence which would justify him in venturing a decided opinion on this point, but the enormous area which the nickeliferous serpentines cover seems to indicate that it will be a very long period before the nickel deposits of New Caledonia will become exhausted.

#### Discussion.

The CHAIRMAN said the paper Mr. Garland had contributed was a very interesting one, and would probably give rise to some considerable discussion, notwithstanding that its nature was rather difficult. At any rate they might hope to be placed in possession of the views of those who had been to the district treated of, which, he believed, was one not very well known, a fact which placed them somewhat at a disadvantage.

Mr. COX had not been in New Caledonia; but there were some points in the paper which aroused in his mind a good deal of interest—more particularly that part in which the author had described the characteristics of the serpentine. He might mention that in New Zealand the serpentine appeared, from the specimens upon the table to be almost identical with that from New Caledonia and was found under the same conditions. While, however, the rocks in New Zealand appeared to be almost identical with those in New Caledonia, it was interesting to note that the mineral contents of the New Zealand rock were quite different. Instead of nickel, copper occurred there, and seemingly under the same conditions. The deposits of copper were not true lodes, but they certainly had a very close resemblance to lodes in certain other places, although they widened out in a very irregular manner. He wished very much to know whether in New Caledonia the nickel deposits which died out in depth and passed into silicate of magnesia had ever been followed down sufficiently far to see whether the same lodes opened out again and other deposits of silicate of nickel occurred below. It would also be interesting to know whether copper occurred with the serpentine and in lodes near the nickel lodes; because he could not help thinking that there must be some sort of connection between two classes of deposits with conditions so very similar in two different places. In regard to the nomenclature of the nickel ores the author had very properly at the beginning of his paper suggested that they should condense some of the names, and that Garnierite and Nonmeite should be joined in one group, but he thought it rather unfair of him, after having written in this way, to propose "chocolite" as an additional name. Probably, however, the author had made the suggestion as a pleasantry.

Mr. MOREING thought the gentlemen present should have been very pleased with the paper they had heard that evening, especially as it marked a new and valuable departure from the class of papers ordinarily read before the institution. It was an account by a member of the profession of the notes he had made while on a professional trip, and he thought that the innovation had opened up a wide and useful field, and had given an example which might well be followed by others who were engaged upon the examination of similar properties. (Hear, hear.) There was no doubt whatever that if this were done they would accumulate in the *Transactions* of the Institution a vast mass of most valuable information which would be of service to future scientists and would result in a much better knowledge of how mineral deposits of all sorts occurred than was now possessed, and would ultimately lead to some correct theory as to how those deposits were formed, a question which was at present very much in the air. What had particularly struck him in Mr. Garland's account of the New Caledonian mines was the rough manner in which at present the whole of the operations seemed to be carried out there. It was an astonishing thing that, though the mines had been worked since 1874 by the French, the methods there should still be of the extraordinarily primitive style described by Mr. Garland, including so curious a contrivance for sending the ore down the hill, and that there should not be some method of treating the mineral so as to remove the waste before shipping it home. The whole thing seemed capable of very great improvement, and he was sure that a practical miner like Mr. Garland must have given the Frenchmen a good many hints. There seemed to be a splendid opening for some of the "out of works" amongst them—(laughter)—to go there and show them a thing or two. He was very much struck, too, with how very small the mines appeared to be. Mr. Garland had expressed a hope that some of the more geologically inclined amongst them would explain how deposits seemed to have a way of getting up to the tops of hills. This feature was not peculiar to the nickel mines of New Caledonia, but he could easily understand that in the hot weather which prevailed the circumstance would impress itself more particularly upon Mr. Garland. The fact had also impressed itself upon him when he had been under the necessity to scale the Rocky Mountains in the winter upon snow shoes. He, too, should be glad if any geologist would be good enough to explain this very melancholy habit of deposits. It would seem to be much more convenient for them to locate themselves in Hyde Park or St. James's Square. He noticed that Mr. Garland, in his paper, stated the brown variety of the ore to be understood to be the richer of the two. The experiments, however, that Mr. Claudet had made, seemed to show that the brown ore was poorer than the green, and in handling the specimens a short time before, he was struck with the peculiar lightness of the brown "chocolite," which certainly appeared much lighter to the hand than the green.

Mr. RICKARD said the paper was rather a difficult one to speak upon. There was very little in it to catch hold of, for Mr. Garland had not given them any combative matter. He would not quarrel with him upon his proposed creation of the new word "chocolite;" although he was opposed to the undue multiplication of scientific terms. He found himself unable to agree with the strictures which had been passed upon the manner in which the New Caledonian mines were worked. He was disposed to think that Frenchmen generally were very correct in their methods of working, and, in judging the circumstances narrated in the paper, it should be remembered that the working was upon a comparatively small scale. He was inclined to believe that the methods used were, under the circumstances, not bad. Their method of transport, too, was not half bad; but, on the contrary, very well suited to its purpose. At any rate the plan was not a new one; for he could recall to memory more than one instance in which it had been successfully applied. It was important to remember that the production of nickel was not entirely in the hands of the New Caledonian miners, and he remembered during the previous week being told that nickel was being produced at Sudbury, at a cheaper rate than the New Caledonian people were willing to part with it for. As to the production upon the island it had reached in times past as large a figure as 100,000 tons per year. There was now, however, a limited production amongst them in accordance with a certain agreement they had come to, and the quantity was now about half the figure he had mentioned. The Canadian people had always been of opinion that the mines of New Caledonia would soon be exhausted and that by holding on they would be able to command the market. Mr. Garland had given the Canadians a very poor consolation in that matter. He had been told upon very good authority that though some of the deposits appeared to be worked out, so many others remained that it would be many

years before the island was exhausted. With regard to the labour used there he believed the Kanakes of the neighbouring islands were very good workmen, and that they worked for about a half what the white men were paid. Then, again, large numbers were being brought under contract from Tonkin. While he sympathised with Mr. Garland's experience in having to climb to the top of the mountain, he thought that the real explanation of the deposit having been found there was not that they had been raised, but that a process of denudation had been continually going on around. It was all a question of the relative hardness and durability of the rock.

Mr. PERCIVAL FOWLER remarked that Mr. Garland had left very few matters of interest undescribed in his paper, which he thought would be very valuable addition to the literature of the Institution, as there were so few engineers who had visited the South Pacific Islands in a professional capacity. Mr. Fowler wished to know if Mr. Garland could give any further information on several points:—(a) As to whether there were other similar or analogous deposits of nickel; (b) the nature of the outcrop of these nickel deposits; (c) if in any instance the subterranean water level had been reached in New Caledonia; (d) if the sulphuretted compounds of nickel had been met with; (e) if so, their composition and general character; (f) whether, in view of the fact stated by Mr. Garland as to the existence of  $\frac{1}{2}$  to  $\frac{3}{4}$  per cent. of nickel in the enclosing serpentine rocks, he had formed any theory as to the origin of nickel deposits by the segregation of particles, or whether there was any evidence as to their origin by segregation, sublimation, or deposition—a subject of so much interest, but on which so little information existed, beyond the work of Daubrée, Eggleston, and a few others. Mr. Fowler concluded by requesting Mr. Garland to give all the information possible in his reply to the discussion on the paper, so as to make his interesting communication the most valuable existing record on the subject of nickel mining.

Mr. G. E. COLLINS thought there was a special interest attaching to Mr. Garland's paper, seeing that it reflected the ideas of a practical English mind upon these deposits, about which so much had been written. Perhaps the author would consent to go a little further, and give his view of the origin of the masses of "red earth" mentioned. M. Levat, in a contribution to the *Annales des Mines*, considered them to be alteration products of the serpentine, caused by solutions carrying iron and manganese. Did Mr. Garland concur with this view, or would he not rather consider them to be formed by the disintegration of the hematite masses on the summits of the hills? M. Levat called them "pockets," whereas Mr. Garland, like M. Benoit in his recent paper in the *Revue Universelle*, spoke of "sheets." Nothing was said in the paper as to the beds of cobaltiferous wad found in the red earth. Were these being worked at the present time? The occurrence of the deposits exclusively in a horizon of the serpentine now exposed at a considerable height above the sea level was a curious fact. It might, perhaps, be that the serpentine, by lateral secretion from which the nickel was doubtless derived, was only nickeliferous at or about this horizon. Could Mr. Garland adduce any evidence for or against this conjecture? Did the serpentine, for instance, contain nickel everywhere, or only in the same horizon in which the deposits occurred? Mr. Moreing's remarks as to the rudimentary nature of the wire tramway used were, perhaps, a trifle hard. He had, himself, dwelt on the small size of most of the mines, which was, of course, a result of the irregular nature of the deposits, and small mines could not support an elaborate plant.

Mr. O'DONOGHUE made a few remarks in which he described the process by which the ships were laden with the ore after it had been carried down to sea level.

Mr. BENEDICT KITTO was most struck with the great dissimilarity between the nickel ore which the author described, and the nickel ores of other countries. In Sudbury, he believed, the metal occurred as nickeliferous pyrrhotite. Some few years before, he believed, a commission had been appointed by the United States Government to enquire into the qualities and quantities of ore, and the methods of working the Sudbury deposits. That Commission reported that there was 650 million tons of ore in sight, which was, of course, a very large quantity indeed, and since that time no doubt a great deal more had been opened up, so that there were very plentiful deposits of ore in that district. The question remained whether they could be profitably worked. The impression he had got, whether right or wrong, was that they had not been very profitably worked. Taking the circumstances into consideration it would have been thought that this might have been accomplished, but it should not be forgotten that the ores contained only from 1 per cent. to 5 per cent. of nickel, whereas, according to the author of the paper, the New Caledonian ores yielded from 8 per cent. to 10 per cent., and, he believed, were sometimes met with so high as 16 per cent. of nickel. He was very glad to hear that the cost at which the ores could be put on board at the New Caledonian ports was 50 francs per ton. His own information with regard to that was that it could be done at two guineas per ton, which was about the same. He understood Mr. Garland to say that the quantity exported in 1891 was 60,000 tons, and that the quantity raised since that time was very much more. As to the possibility of the ores being worked out, he had seen it stated somewhere that about two-thirds of the island contained the nickeliferous deposits. A good deal of the district was certainly too bare to be worked successfully; but there could be no doubt that the deposits were enormously large and very widely disseminated throughout New Caledonia. Mr. Cox had spoken of the copper occurring in the serpentine in New Zealand, and that it occurred near the surface as silicate, going down into oxide and native copper. Those were exactly the conditions under which copper occurred in the Lizard serpentine in Cornwall. Mr. Kitto concluded by supporting Mr. Cox's objection to the importation of new names into the mineralogical dictionary, and cited an instance where considerable embarrassment had been occasioned by the use of two names for the same substance.

The CHAIRMAN remarked upon Mr. Garland's reference to the east and west parts of the island, and quoted an article from the *Mining Standard* of Sydney, published in 1892, in which a statement appeared that the western portion of the island contained by far the richer mines. The statement might of course be an *ex parte* statement, but he should like to know what Mr. Garland's opinion was upon the matter. One could hardly accept the hypothesis of denudation as a sufficient explanation of the height at which the ores were found, for it would follow that the ores occurred in the harder rocks, unless, indeed, it were the case that they had occurred also in those parts of the formation which had been denuded away.

It being now an advanced hour, and the audience having decreased considerably, Mr. GARLAND offered to postpone his reply to the criticisms directed towards his paper, and the proceedings accordingly terminated with the usual vote of thanks to the Chairman.

Messrs. HENRY BATH and Son's copper report, dated February 17, has the following:—The Chile charters for the first half of this month are advised as 110 tons fine copper. The latest exchange is 12½d. At the commencement of the fortnight the price of G. M. B's was £41 5s., and it steadily receded until £41 7s. 6d. was reached on the 9th instant. On the 12th the market opened at £5s. advance and improved to £41 5s.; yesterday £41 2s. 6d. was again accepted but there was an improvement in the afternoon and the price closed at £41 7s. 6d. The fall in silver has to a great extent disorganized the trade but just now there is a slightly better demand from consumers, who, however, on the whole maintain an attitude of reserve. The position in the United States remains the same and so far there are no signs of any diminution of production. But little business is passing with this country as the prices asked are above what the buyers here will pay so that a certain accumulation is going on. The exports for the first half of this month are about 2200 tons. The price from there comes rather easier today. Outside of our figures the arrivals and deliveries at Hamburg, Rotterdam, and Antwerp amount to about 1400 tons. Details of the French figures are not yet to hand. Imports of American copper into England have been 1149 tons, and into France (P) tons, against 2367 tons last year. Total actual deliveries are 3272 tons against 3167 tons imports. The stocks have decreased 215 tons. Total visible supply shows 47,147 tons against 47,152 tons last fortnight. Transactions in furnaces material comprise about 1244 tons of Chile and Mexican ore at 7s. 11d., to 7s. 6d.; 108 tons of Argent Chili regains, on private terms; and 16 tons of Spanish precipitate, to arrive at 8s. 3d. per unit.

## MEETINGS OF MINING COMPANIES.

### MECHERNICH (RHENISH PRUSSIA) MINING COMPANY.

A further decline.—Depressed state of the markets.—The prospects of the lead industry.

THE annual meeting of shareholders in this company was held at Cologne, on February 16. The CHAIRMAN said: Before we report to day in the usual manner about the past business year, we wish first to honor the memory of him who has been at the head of our company for many years past, but remains no longer with us—namely, our honoured president, Carl Kreuser, Esq., who died on the 19th June of last year. As one of the founders of our company, in the management of which he took an active part from the beginning, he gave his whole attention to our concern. With rare freshness and activity even in old age he strove constantly to do the best on his part for the welfare of our undertaking, and for this reason, we are certain, that you will always cherish the memory of him. Now, as regards the result of last year's business we very much regret that we have again to report a further decline. The reason of this will be explained to you by the report of our managing director, and the rest you will see in the balance sheet put before you. The net profits £6,288.60 mks., together with the balance brought over from 1892, 528.31 mks., were not sufficient for the writing off to the usual extent, and for this purpose 199,427.95 mks. had to be taken out of the reserve fund.

	BALANCE SHEET.
Dr.	Marks.
Mining property, 1892	2,529,000
New works	28,569.63
	2,557,569.63
Written off	200,000
Ground property, 1892	909,530.92
Addition	265.50
Offices and workmen's dwellings, 1892	191,271
Written off	3,825
Gasworks, 1892	287,240
Written off	5,745
Smelting works, 1892	409,817
Addition	51,683.04
	451,801
Written off	9,230.01
Inn, hospital, and school for miners, 1892	228,921
Written off	4,538
Railway property, 1892	575,954
Written off	28,680
Wire tramway, 1892	101,854
Written off	5,793
Machinery and utensils, &c., 1892	1,055,584.45
Addition	27,241.07
	1,082,343.38
Written off	29,133.82
Debtors	491,037.33
Materials	400,569.94
Stocks of ores and metals	2,793,627.40
Cash, bills, and investments	1,597,118.05
	11,337,194.33
Cr.	
Capital	9,600,000
Creditors	978,612.28
Reserve fund	760,572.05
Profit and Loss—Brought over 1892	528.31
Gross profit 1893	86,288.60
Transfer from reserve fund	199,427.95
	286,244.85
Written off	286,244.85
	11,337,194.33

The MANAGING DIRECTOR said: In my last report I gave you as the cause of the diminished results the fall in the price of lead and silver, and while working in 1893 even more unprofitably the reasons for this further decline remain the same as before, the price of lead and even more that of silver has declined still further during the past year. The London price of Spanish lead was in the different months, viz.:—

January	£9 15 5	July	£10 0 0
February	9 11 1	August	9 19 4
March	9 15 10	September	9 15 6
April	9 14 2	October	9 11 10
May	9 11 1	November	9 14 6
June	9 7 6	December	9 10 1

Average price for the year £9 13s. 10d.—viz., 74 per cent. lower than 1892. The position as regards the production and the sale of the lead has in no way improved, on the contrary business becomes always more difficult. Australia is still throwing its large production upon the London market, and in addition there are Spain and North America, the latter with its bonded lead of Mexican origin. The desilverising works in Hoboken, near Antwerp, still render any sale to Belgium, Holland, or France impossible, and greatly interfere with the sale to the principal places of consumption on the banks of the Rhine. These works profit not only by their favourable situation, the cheaper wages and lower freights, but also by the fact that although they are founded and worked by German (principally Frankfurt) firms, they are spared the onerous burdens which the German works have to bear in consequence of the legislation during the last 10 years, regarding the protection of workmen and new taxes. Besides the lead of these works, also Australian and other foreign lead is shipped from London in large quantities to Cologne and further up the Rhine. Different events of last year, of which it was hoped that they would favourably influence the price of lead, have not had the desired effect. There was, firstly, in July, the change in the Indian currency, and soon afterwards, in the United States, the repeal of the Sherman Bill. The great fall in the price of silver, which at once followed these two events, raised the hope that such mines would have to shut up the production, which consists chiefly of rich argentiferous ores, and which mines are also found in great numbers in North America, but most of the mines there, or part of them, having been shut up for a short time, could continue or resume working again. The reason thereof was that the wages paid until then (about 33½ or 44½ marks per day) could be considerably reduced, and still leave enough for the existence of the miners. Even a greater effect than from the fall in silver was expected from the plan of the new American Government to break altogether with the old principle of political economy, and to introduce considerable reduction in the tariff. When the proposed changes were published it seemed as if better times were coming for lead and some of its products, as it was intended to reduce the present duty of 22 per 100 lbs. to \$1. During the debates of the tariff bill our expectations have already been lowered, because for lead products the duty has already been raised to \$1½, and with the state of affairs in America, and the usual practices there, only recently evinced in the deliberations of the Sherman Bill, it appears more than doubtful whether the reduction of the duty on lead will take place at all, and thus make an export of lead to America, and a consequent unburdening of the European lead market possible. The prospects of the lead industry, especially for Germany, must therefore be considered most unfavourable. It is well known that most lead mines cannot exist for any length of time under the present conditions, and that applies even to mines raising with their lead ores a certain amount of zinc ore, the latter of which can still be profitably utilized with the present price of zinc. But what social consequences a suspension of lead mining and smelting would entail is difficult to imagine. In the face of such sad prospects the time seems to have arrived when the Government ought to show less indifference, and support the lead industry, as it has often done the iron industry—even recently, on the 1st May last year, by special

freight tariffs on coke, slags, &c., but which freights are not available for lead smelting works, if it granted, for instance, reductions in freight, and a reasonable import duty. Freights ought not only to be greatly reduced on materials used in the production of lead, such as coal, coke, slags, iron ore, &c., but also on lead itself, especially to neighbouring countries, in order to make it possible to meet there successfully the new competition, and to regain former markets. Such adaptation of freights to the changing position of the different industries would also be in accordance with the promise given by the representatives of the Government at the time when the railways were taken over by the State, namely, to apply any surplus money to raising the commercial intercourse of the country by extending the railways, by improving their carrying capacity, and before all by reducing the freights. All this has thus far principally remained a promise, although no opportunity has been lost to point to the depressed state of the industries, especially of the lead production, and to the great necessity of a reduction of freights. Altogether, it can well be maintained that German industry has to bear, besides other burdens which have gradually been heaped upon it, the heaviest one in the shape of unusually high railway freights. As regards an import duty on lead I am of opinion that it would be sufficient to fix it at 2 mks. per 100 kilos. The levying of such a duty should present no great difficulty for the Government, even from such States to which they are bound by commercial treaties for some years to come, for these States raise hardly any lead ore themselves, and only possess a few smelting works which produce not even enough lead for the requirements of their own country. They have, therefore, no interest in the importation of lead into Germany. As regards the desilicating works near Antwerp, the welfare of the same cannot concern Belgium much, for the interests at stake are not Belgian but foreign. Moreover, a German import duty on lead would even render lead cheaper for the Belgian consumers, as the Rhenish market would be closed to the Hoboken works, and the same would be still more confined to the Belgian market. A German import duty could, therefore, be only beneficial for Belgium. Concerning silver, I need only refer to the occurrences which have taken place in India and North America, and the consequences of which are well known. A loss on silver was, under these circumstances, also with us unavoidable. We obtained the following prices:—

Mks.	Mks.
January .....	114·59 per kilo.
February .....	110·03 ..
March .....	109·90 ..
April .....	111·29 ..
May .....	112·05 ..
June .....	111·69 ..
Average price for the year, mks. 107·78; viz., 6·24 per cent. low than 1893.	July .....
	95·50 per kilo.
	August .....
	99·43 ..
	September .....
	99·81 ..
	October .....
	97·58 ..
	November .....
	95·46 ..
	December .....
	94·55 ..

From the workings of the Meinertshagener Bleiberg we produced 678 tons of Potter's ore and 34,777 tons lead ore, which latter has been reduced at the smelting works in 14 roast and six blast furnaces into 20,232 tons lead and 14,666 kilos silver. In the working of the mine, which also in 1893 was principally carried on underground, no changes have taken place. In order to carry over the third gallery of shaft Virginia accumulating waters safely to the underground pumping engines of shaft Schafberg, and also for the erection of a mechanical rope conveyance, a new connecting passage in the third gallery was commenced from each side at the two shafts. For the quicker accomplishment of this passage, about 1200 metres in length, arrangements have been made for boring by compressed air, by which its completion may be looked for in the course of next year. The engine shaft Virginia has been sunk 25 metres deeper, and at this depth a crosscutting was made towards north for the completion of the work. For the roast furnaces of the smelting works a new chamber of 3100 cubic metres, and with a special chimney 60 metres high, has been erected and set working, so that the existing 18 roast furnaces, which until lately had only two chambers with a chimney each, have now three chambers with a chimney each. The number of workmen has been reduced by 90; wages have not been altered in spite of the unfavourable state of affairs. The companionship of miners had during the last year considerably more expenses, which have risen from 85,997 mks. to 96,502 mks., and the cause of this was principally the extraordinary increase in the number of invalids, which in former years averaged between 16 to 30, but reached 64 in 1893. This is also one of the results of the law of the 22nd June, 1889. The simultaneous grant of a pension from the companionship of miners and the accident insurance fund is too tempting not to be made use of on every possible occasion. It is, therefore, not difficult to see even now that a good deal of labour will be lost, not to speak of other disadvantages which arise under such circumstances. The companionship of miners had to raise the subscription of miners by 10 per cent., in order to make both ends meet; for 1894 a further increase of 10 per cent. has been decided upon, which will hardly be enough for avoiding a loss. The contributions to the insurance fund for accidents and old age as well as to the companionship of miners amounted to 199,141·16 mks., the company paid 84,749·95 mks. taxes, and made an allowance of 33,377·57 mks. towards the different institutions for the welfare of the miners. These three sums together amount to 317,268·68 mks., or about 3½ per cent. on the capital of the company. The balance sheet has been made up according to former solid principles, and with strict observance of the prescription of the law. We have had no losses in 1893.

The report was agreed to, and business therupon ended.

### OPHIR CONCESSIONS AND EXPLORATION COMPANY, LIMITED.

The claims to be pegged out.—A reduction of the directorate.

The second ordinary general meeting of the Ophir Concessions and Exploration Company (Limited) was held on Wednesday, at the Cannon-street Hotel, under the Chairmanship of Mr. A. P. MATHESON.

The SECRETARY (Mr. W. H. Oiliffe) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen, the report and accounts have been circulated, and I suppose that as you have all received a copy we may take them in read. We have seized the very earliest opportunity in the year of calling you together to consider our report. At the last meeting we reported to you that we were making the sale of claims, and that we expected to get it completed almost immediately. Unfortunately we found that, owing to the complexity of our title and the number of documents dealing with it, one put on top of the other since the formation of the company, it was an extremely difficult thing to arrange the legal part of the business, and we, therefore, had to set to work entirely to re-arrange our position with the Mozambique Company, but upon the basis of the agreement we had already secured from them. We have now clear and lucid. It is now all compressed into one document and when, as we hope to do, we make further sales of claims, we shall have no difficulty whatever in giving the purchaser a perfectly clear and satisfactory title to the property. During the past year business has been very slack in the City of London and nearly every other part of the world, and, therefore, we have not been able to make any further sales of claims that we expected to do. Things are now beginning to get a little brighter, and I think we may reasonably expect to do further business of the kind during the next 12 months. The Gold Fields of Mozambique Company is doing extremely good work. Mr. Alford, our representative at Massi Kessi, is now in England—in fact, he is present at this meeting, and will be able to tell you something about the work they are doing and what sort of man their representative in the colony may be. I believe he is a thoroughly satisfactory and energetic man. He has, as you will see from the report, pegged out a good deal of property, and has made such satisfactory progress that I believe the Gold

Fields of Mozambique are now contemplating the possibility of forming a company to take over some of the claims they have located with a view of their being actively worked. That, of course, is extremely satisfactory to us because we shall benefit from the large holding we have in Mozambique shares. You will notice in the report that we inform you negotiations have been entered into with parties with a view to getting our claims located for us during the forthcoming year without any expense. We were approached by a gentleman who was going out to the Massi Kessi district, and who asked us whether we could co-operate in any way in locating the claims. Our rights, as I dare say you know, are exceedingly valuable because they give us privileges which the ordinary prospector in Mozambique has not got. The ordinary prospector, amongst other stringent regulations, has to pay 10s. a month for every claim he locates, whether it is paying anything or not, which amounts to a considerable tax upon the poor man. In addition to that, he has to pay at least 20 per cent. royalty upon whatever he produces, whereas we only pay 10 per cent. Therefore, it is an attraction to the prospector to be able to peg out under our concession. We have arranged with this gentleman that he shall do what he can with a hundred claims during the current year, and I have no doubt that he will be able to do something. Of course, it is impossible to say how much he will be able to peg out, but we shall at any rate have made an experiment at no expense to ourselves. Well, gentlemen, I think I have alluded to all the points of interest of which I have anything to say to you, and as there promises to be a good deal of discussion at the meeting to-day I don't think I will detain you any longer at the moment. I will conclude, then, by moving—"That the report and accounts, as presented, be adopted," and I shall be pleased to answer any questions which may be addressed to me.

Mr. HENRY B. GREENWOOD seconded the motion.

Mr. WESTON invited the attention of the board to the fact that, whereas the rent and office expenses for the year past had come to £1692 17s. 2d., there was only cash at the bankers to the extent of £637 9s. 8d., and such a sum at the present rate of expenditure would be gone in about four months. The directors would then have no alternative but to make a call. It ought certainly to be a matter for the serious consideration of the board whether such an expenditure was necessary at the present period of the company's existence, and whether something could not be done to decrease it, so that the necessity for the call might be obviated. The shareholders had not yet heard whether the board were receiving any money for the sale of claims; if so, the complexion of affairs might be very much altered.

The CHAIRMAN, in reply, said he had intended to address the meeting later on upon the question of the call. They intended immediately to make a call, a course which was clearly shown by the balance sheet to be necessary. He did not think anything could be saved upon the office expenses. These had been brought down to a minimum. With regard to the question whether the company had received any cash, the shareholders would remember they had been informed at the last meeting that the terms which had been arranged with the Mozambique Company were that the company should receive £600 in cash and £22,000 in fully paid shares. The board had not yet received the £600 in cash, but they held bills to the amount.

Mr. HOLLOWAY referred to an item of £376 15s. 10d. for law costs in connection with the formation of the company, and enquired the nature of these disbursements.

The CHAIRMAN replied that £182 10s. was expended upon stamp registration, and solicitors' costs came to £94 0s. 2d. The item of £170 19s. 10d. for law costs was the consequence of the very long negotiations about the deed of grant necessitated by the sale of some of the properties.

Mr. HOLLOWAY said he should be glad to have some further information as to the directors' fees. The amount was included in the office expenses, and he should like to see it set out separately. He saw a note in the sheet to the effect that the liquidation expenses were not yet ascertained. He should have thought sufficient time had elapsed to enable the information to be obtained. He knew that some applications from the shareholders for the unallotted shares had not been acceded to, and yet he saw by the balance sheet that there were 8900 shares still unallotted. There should be some explanation of this given. The additional question he should like answered was what consideration was to be given to the gentleman who had volunteered to peg out the company's claims.

The CHAIRMAN, in answer to these questions, said that the Mozambique Company had met them in a most amicable manner, and the legal difficulties had not been occasioned by them, but so many people had been involved in the question of title, and so many references had been made to different lawyers representing the different people that the cost had necessarily been high. They had to deal with the liquidator and his lawyer, and then there was their own lawyer, besides that of the Mozambique Company. With regard to the directors' fees, these were authorised by the Articles of Association, and they amounted to £942 19s. 4d., which had been very fairly earned. Meetings of the board had been held every week, and in the case of some of the directors there had been much more to do than the attendances at the weekly meetings. In some cases there had been almost daily attendances upon the company's business. The sum authorised by the Articles of Association was £750 per annum. The expenses of the liquidation, as to which enquiry had been made, could not yet be ascertained. As to the unallotted shares that matter was wholly in the hands of the liquidator, and the board had nothing to do with it. The board allotted the shares to all the shareholders in the old company who applied for them, and handed the remainder of them over to the liquidator. As to the bills receivable £600, as he had already said, was due from the gentlemen who purchased the claims, and an additional hundred was for a bill given to the old company by a gentleman to whom they had lent that sum. The circumstances of the loan were unknown to the present board, but the bill remained in their hands, and was reckoned as one of the assets of the company. The interest they were giving to the prospector who had gone out to the colony for pegging out the claims was 15 per cent. of the property he pegged out, and all in the room would agree that the interest was a most moderate one.

Mr. CASTLE complained that the amounts in the balance-sheet were not set out in sufficient detail. The CHAIRMAN said the shareholders must deal with the auditor upon that point. The motion for the adoption of the report and accounts was then put and carried.

The CHAIRMAN said the next matter was the election of a director. Mr. H. H. Bridgeman, the retiring auditor, offered himself for re-election. In addition there had been two other gentlemen nominated for the vacancy.

Mr. ROBINSON proposed the re-election of Mr. Bridgeman.

Mr. HOLLOWAY seconded the motion.

Mr. CASTLE moved an amendment, opposing the re-election of Mr. Bridgeman.

Mr. BRITAIN supported the amendment.

The amendment was, after some discussion, put and carried, and the meeting resolved that the board should be decreased by one.

Mr. CASTLE said he wished to move a resolution reducing, to the extent of £100, the amount in the aggregate, receivable by the directors in fees.

The CHAIRMAN said there was some difficulty in dealing with the resolution without notice, but he could assure the meeting, with the consent of his co-directors, that the board would not receive more than £650.

Mr. ALFORD, the company's representative in the colony, in accordance with a request that he should address the shareholders, said he was glad that the meeting of the company had taken place during the few weeks he intended to spend in England, for he thought it advisable that the shareholders should know by whom they were represented so far away. Perhaps some particulars as to the country would be interesting to the meeting. The objects of the company were to acquire indirect and also direct interests in mining properties, and they had the option from the Mozambique Company

to locate a number of claims in their own ground, and he thought there would be no great difficulty in taking other claims in other companies, formed to develop territory, in other parts of the country. At present there were very few people, indeed, upon the country which was a very large one and comparatively very little known. He had been out there himself from October in the year before last until now, when he had come home on a very short visit. During the year and a half he had been in the country he had been about a good deal, and his opinion was that it was a very promising country for mining development. At present there were no mines working there and the reason was that there was a very embarrassing want of communication to be overcome. That difficulty would, however, soon be solved, when the railway which it was in contemplation to make had been completed. At present, owing to the lack of communication, they could get positively nothing. Machinery was out of the question, and the same difficulty was experienced with regard to tools, so that the work dragged very heavily. This year, however, he hoped to see a much larger number of men enter the country, and in that case he knew there would be a good deal of work going on. Numbers of people were starting for the country, and what they wanted was a set of prospectors. The idea of the board in sending some one to peg out the claims was an excessively good one. The more there were who went there the more chances there would be of one of them hitting upon something good, and in the event of such a discovery the company, of course, would share in its results. The country around Massi Kessi was very densely covered with bush, and upon that account it was difficult to get about. That, of course, was an obstacle in the way of prospecting work, but could offer no hindrance to the effective pursuit of mining, when once a favourable location was found. The difficulties he had mentioned, which they had to encounter, would be to a large extent removed by the railway when it was completed. To his mind the outlook seemed so favourable that he was unable to divine the slightest reason why another Johannesburg should not be established in the country. The geological conditions were practically the same all through Central Africa. The Gold Fields of Mozambique, which, as they knew, was a subsidiary company to their own, was doing good work around the Massi Kessi district. They had a very energetic man there, and in last September he had visited the property. Already they had a large number of claims pegged out. Two of the principle properties of the company were known as the Lion and the Tiger. He had a very good opinion of these properties. He had made several explorations in the valley, and every time he had found gold, though not always in payable quantities. What was wanted was to discover the points where the gold was to be found in payable quantities. He hoped that he should have the pleasure of meeting them upon some future occasion, and that he should then be able to tell them that a good deal had been done in the company's interests. More men were, however, wanted to prospect the country. It was no use sending one man, whatever might be his scientific attainments, to look over a country four times the size of Europe. (Laughter.)

Mr. C. A. MORRIS said a few words about the railway which was being constructed in the country, stating that the part which had actually been built was 75 miles in length, and that this stretch was still working very satisfactorily indeed. They had met with a good many difficulties, but not so many as they might have anticipated. In addition to the 75 miles he had mentioned there was material laid down for an additional 33 miles, and that would be completed as soon as the weather was favourable. There was no doubt that when the line passed through the fly zone one of the greatest difficulties against which the colonist had to contend would be removed, and with the aid of capital the country would begin to develop satisfactorily.

The CHAIRMAN said he had some few words to say to the meeting about the call. When the present directors were first placed in office they gave an understanding to the shareholders that no money should be spent upon explorations, and that the expenses should be kept down to their very minimum. During the last twelve months, however, they had received many letters asking them why they did not do something to advance the interests of the company. To expect the directors to do this without spending any money was simply preposterous. Unless they were allowed to incur some expenditure they could do absolutely nothing, and the capital of the company might be exhausted in meeting the directors' fees without any result. This year, therefore, they proposed to make some disbursements upon developing the claims, and if the board were to do anything the shareholders must repose a certain amount of confidence in them. After what had just been said by Mr. Alford and Mr. Moreing it was obvious that if they were to spend a little money in developing the property the company would be in a position to do something by the end of the year. Of course, it would entail a call, but they could not expect to receive profits without embarking a certain amount of capital.

A vote of thanks to the Chairman and directors, suitably acknowledged by Mr. A. P. MATHESON, brought the meeting to its termination.

### THE PUNJOM MINING COMPANY, LIMITED.

#### Meeting at Hong Kong.

The second ordinary general meeting of the above company was held at Hong Kong on January 12, under the presidency of Mr. JAMES ORANGE.

The SECRETARY having read the notice convening the meeting, The CHAIRMAN said: I trust you will think that the results of the working are satisfactory, and if there had been a larger amount of capital subscribed your board would have been justified in recommending a dividend, but we consider that at least two or three months' full expenses should be kept in hand in case of accident to plant or unforeseen contingencies, and the last call of 25 cents is being reserved for the extensions to plant which will probably be required for treatment of concentrates and tailings. I am exceedingly glad to be able to announce that at last we have practically finished with the London company, and we are now awaiting the settlement by our Singapore agents of the Singapore claims in detail. The amount of work and trouble entailed by the formation and liquidation of the London company has been very considerable, and we regret that not only do we lose the debt due to us of the Punjom Pahang Gold Company, but in addition have to pay the sum of about \$24,000, being the amount owed by that company in London and Singapore. Your board are glad to be able to announce that we have obtained an extension of our prospecting concession, the acting Resident of Pahang recognising in the interviews I had with him the amount of work done, the large sum of money spent of this and the former company; and though I think that the Government should do more for us than has been done, there is the unfortunate fact that the finances of the State of Pahang have been very strained. I hope that the State of Selangor will by its assistance enable the Government of Pahang to act more generously to us in several matters. The board is strongly of the opinion that as representatives of the pioneer mining company of the State we should have, when we show ourselves fairly established and in working order, a permanent and perpetual lease without conditions of the mining concession area, and we will urge this upon the Government. Every country in the world recognises pioneer claims, and we were the first to systematically work lode mining in the State, and have spent more money in the State than any other company. We are also of opinion that the Government tax of five per cent. is a heavy one, and should be reduced in the interest of mining, and that the Government should undertake the escort of gold and specie as in other countries, and give more adequate police protection than we possess at present. The road which is projected from Kuala Kubu in Selangor via Raub to Kuala Lepis will pass within three miles of the mine, and will be of great utility to us. It will enable us to import specie and send our gold overland instead of by the tedious river journey, and will also have the very important result of introducing labour freely into the country.

The report informs you of the work done. The August shaft is now sunk deep, 68 feet below the 10 foot level, and besides the other developments, works are proceeding, such as a trial shaft south of the present mine, and drives south and west, which bear very promising indications. The new battery will probably be finished the end of this month, but the new boiler necessary to supplement the existing one, though ordered in time, was unfortunately delayed at home by reason of the coal strike, and arrived at Singapore when the north-east monsoon had set in, and consequently there has been experienced a difficulty in getting transport to the Pahang river. It is now being sent up the river, and we hope will be fixed before the end of February. With the new battery the output should be increased to 1000 tons a month, and this will enable us to crush a quantity of low grade ore which has not been touched while we were requiring the gold for current expenses, and will enable us to maintain our present yields at least without increased expense. The cost of the additional plant is included in the balance sheet. The treatment of concentrates and tailings is a very important one, and though the stacking is carefully done and little is wasted, still it is a certain amount of gold lying idle. We are fortunate in having Mr. Fenwick at home to assist us in our negotiations for a plant to treat 1000 tons per month, and we hope to be able to arrive at a decision on the subject very soon. Mr. Blamey's accident has proved more serious than was at first anticipated, and we regret to say he has had to undergo two operations at the Singapore Hospital, in order to set the broken bone of the arm. It is hoped that the last operation has been successful. Fortunately, all plans for future work had been arranged by Mr. Blamey and myself before the accident, and, therefore, the shareholders need be under no anxiety as to the progress of work during his absence. Mr. Blamey has worked hard and successfully for the company, and has every confidence in the future of the mine, and we all trust that he will soon recover and be able to resume charge of operations. In Mr. Phillips, who has charge of the mines, we have an old servant of the company with a thorough knowledge of the country, and particularly of the mine, and with a particularly keen interest in the welfare of the company, and we have every reason to be satisfied with the way work is being carried on at present. I will not detain you any longer, but will be glad to hear any remarks from shareholders, and to answer any questions.

Mr. R. M. MEHTA enquired whether the Preference shares were not entitled to cumulative dividends at the rate of 12 per cent. from the date of the commencement of the issue of the shares or from the reorganisation of the company.

The CHAIRMAN: From the reorganisation of the company. We cannot deal with any interest due by the old company, we can only deal with the liabilities of the present company.

Mr. MEHTA: When the new company took over the assets and liabilities of the old company the interest then accrued on the preference shares formed a portion of the liabilities taken over.

The CHAIRMAN: No; they were not debentures, they only had a preference right in case of any dividend being declared or any profit made to a cumulative dividend of 12 per cent.

Captain E. BURNIE asked why the company had not secured the concession of a lease.

The CHAIRMAN said the reason of the delay was the uncertainty in the minds of the directors. The question as to which way the lode was running would, of course, greatly influence them in the selection of ground. There was no occasion for hurry, seeing that the company had the sole right of 100 square miles up to 1898.

Mr. RAFF asked for more information as to the workings in the mine.

The CHAIRMAN explained that the directors had refrained from publishing reports because they did not desire to give other companies the information. Replying to further questions the Chairman said that about 400 labourers were employed in the mine, and there were 22 heads of stamps going.

The motion for the adoption of the report was then put and carried unanimously.

The auditors having been re-elected, the meeting terminated.

## TOTUMO ALLUVIAL GOLD COMPANY.

### Meeting in Glasgow.

An extraordinary general meeting of the shareholders in this company was held this week in the Religious Institution Rooms, Glasgow, under the presidency of Mr. JAMES DUNNACHIE, to consider the following resolution:—

That the company approve of and confirm a provisional minute of agreement, bearing date the 8th day of February, 1894, executed by and between the company on the first part, and Walter McLachlan, chartered accountant, Glasgow, as trustee for a syndicate intended to be formed and registered under the Companies Act, 1862 to 1890, to be called "the Fernandes Mines Syndicate (Limited)," and authorise the directors to see to the due fulfilment of the same.

The CHAIRMAN formally moved the adoption of the resolution. It was an exceedingly simple resolution, but it had been obscured and misunderstood. The circular issued by opponents had given to a great many people the idea that the directors were proposing to sell the most valuable part of the property to a syndicate for £3000. (Applause.) If that were true it would be a very stupid bargain to make, particularly when they would not get the £3000. That sum represented the capital of a syndicate which was to be formed to prove the mines. The Totumo Company did not provide a shilling of the money. The syndicate was not for buying out the Totumo Company, but for co-operating with it in selling concessions, and whatever was done would be done mutually. Whatever profit accrued, the company would receive two-thirds and the syndicate one-third, from which any deductions for promotion purposes would come. The bargain was a remarkably favourable one, it had the unanimous approval of the board, and was supported by a great majority of the members of the company and by more than four-fifths of the capital of the company.

Mr. ALEXANDER PARISOT, in seconding the motion, said he was the originator of the syndicate. It appeared to him that if the shareholders generally knew the nature of the property they possessed on the other side they would willingly sanction what had been done.

Mr. WILLIAM JOHNSTONE proposed as an amendment:—

That the proposed special resolution be not passed until material modifications in favour of the company have been made upon the agreement on the lines indicated in the circular issued by the committee of shareholders.

The more he looked at the agreement, he said, the more he was convinced that it was utterly opposed to the interests of the company. (Applause.) It was an elaborate document, and it was prepared in a very one-sided way. The second article virtually bound the company to part with 19 reef mining concessions; in fact, it compelled them to relinquish all mining rights in the property except the mining of alluvial gold. Moreover, there was nothing to prevent the syndicate buying the company out.

Mr. HENRY NELMERS seconded the amendment.

After a somewhat long discussion a vote was taken, with the following result:—For the motion, 66; for the amendment 33. As this did not give the three-fourths majority necessary, it was arranged that a poll should be taken.

## PUBLICATIONS RECEIVED.

"A Treatise on Mine Surveying." By Bennet H. Brough. (London: Charles Griffin and Co., Exeter-street, Strand). Price 7s. 6d.

"Leaves from the Calvert Papers." By Graham Hill. (London: W. Milligan and Co., Camden-road, N.W.).

The Directory of Directors, 1894. By Thomas Skinner.

The English Illustrated Magazine.

## MISCELLANEOUS MEETING.

### M. B. FOSTER AND SONS, LIMITED.

#### A careful management; but a bad year.

THE fourth annual general meeting of the shareholders of this company was held on Tuesday last, at Nos. 27 and 29, Brook-street, under the Chairmanship of Mr. MATTHEW ANTHONY WHICHELO.

The SECRETARY (Mr. Alexander Knight) read the notice convening the meeting.

The CHAIRMAN, in moving the adoption of the report and accounts, deplored the disappointing record which had to be submitted to the shareholders. It would be well, in the first place, to consider the position of the export branch of the business, owing to the seriously diminished returns upon which they had been unable to declare a dividend. It was well known that the experience of the past 12 months in Australia had been unparalleled in misfortune and disaster, so far reaching in their character, that some time must inevitably elapse before a revival. In spite of the calamitous state of things they had practically come out of the ordeal scathless as regards monetary loss, the only bad debts made in Australia during the year amounting to the trifling sum of £55. He hoped, therefore, they would appreciate, and give full credit for, the anxious care so successfully exercised by the board and the company's correspondents in this respect, and he laid greater emphasis on this fact because the lying tongue of rumour put about that they had lost many thousands of pounds during the crisis. The diminished demand for bottled beer in Australia could best be realised by reference to the official records of shipments made from the United Kingdom during 1893, as compared with those of the three years immediately preceding, which period represented the four years of this company's existence. The figures he would quote. They were pregnant with information, unhappily the reverse of encouraging. In 1893 the total quantity of beer in glass shipped to Victoria represented only 8060 barrels, whereas in 1892, 1891, and 1890 the published returns were, respectively, 22,505 barrels, 28,968 barrels, and 34,879 barrels. Again, turning to Sydney, their chief market, they would find that the quantity shipped in 1893 was 19,777 barrels, as against 26,210, 30,630, 30,063 in the previous three years respectively, not so large a falling off as at Victoria, but still nearly 25 per cent. against 1893, as compared with 1892. The other Australian ports told the same depressing story—Adelaide, for instance, taking only 4158 barrels in 1893, as against 8634 in 1890, and Queensland only 7317 barrels last year, as against 14,958 in 1890, these two markets showing that the consuming power had declined one-half in the four years. The loss from the shrinkage in demand was, apart from the reduced output, aggravated by the increased colonial tariffs as well as by falling prices, the latter, consequent upon the inevitable competition arising from the accumulation of stocks held in the colonies, resulting to the company in a decreased profit last year of £12,000 in the export department as compared with 1892, and such deficiency at once furnished the reason why the 6 per cent. dividend paid on the ordinary shares a twelvemonth ago was not forthcoming for the year under review. Again, the seriously decreased turnover in beer shipped necessarily increased the percentage of our production expenses, as many heavy standing charges could not suddenly be reduced in correspondence with the fluctuation caused by a falling demand, which, after all, might be only temporary. As they were reminded in the report, the new home trade centre now being worked from the company's export depot at North Woolwich was quietly developing in a satisfactory manner, and there was no reasonable doubt whatever that a considerably increased home trade business would be expanded from that address during the current year, which would assist in the direction indicated by reducing standing expenses. They had met with some disappointment owing to the insignificant consumption at the Chicago Exhibition; but they hoped to gain something from the advertisements, and the shareholders were probably aware that they were awarded a medal and highest diploma for the Bugle brand. They, likewise, got advice on the 1st inst. that the company had been awarded a gold medal at the Batavia Exhibition. Passing on to refer to the home trade prospects, the Chairman said there was every reason to hope that the opening of a Brighton branch would increase the revenue of the company and lead to further developments of the company's business. The directors had not taken the step without anxious thought. They had done all they could to serve the common interests of shareholders and board, and would continue to do so in the future. (Applause.)

Mr. JAMES SCOTT WOOD seconded the motion, describing the achievements of the board since the company's birth in 1890, during which period the shipments had fallen off 48 per cent. with a reduction of no less than 70 per cent. upon the export department. Several new foreign markets had opened up within the year, but the most interesting of the company's efforts had been in pushing the home trade. Prior to the incorporation of the company that part of the business had been the largest of its kind in the United Kingdom, the output of beer in 1889 being 235,000 dozens. That great quantity had been increased in four years by persistent "pegging away" and good management to the enormous total of 563,000 dozens (nearly seven million bottles), which was what was delivered last year. In the same period the mineral water sales had increased by 60 per cent. Profits on both articles had kept pace with the turnover, as no reduction had had to be made in price. An entirely new business for absolute cash had been built up during the past two and a half years—viz., that of light beer in bottle, and it already absorbed 5000 hogsheads of ale and stout especially and exclusively brewed for the company. These beers had exactly hit the public taste, they were daily increasing in popularity, and the possible expansion under this head was well-nigh limitless. The North Woolwich home trade centre was being actively developed, and it precisely justified the forecast uttered 12 months ago by the Chairman, Mr. John Harrison Foster. Mr. Wood, in conclusion, asked for the support of the shareholders in pushing the business done by the company. (Cheers.)

After a short discussion the motion was put and carried unanimously. The retiring directors, Mr. F. B. Roberts and Mr. H. T. M. Howes, were, upon the motion of Mr. GLASSEN, seconded by Mr. THOMPSON, re-elected. Mr. GLASSEN proposed a hearty vote of thanks to the Chairman and directors, speaking cordially of their past efforts in the service of the company, and the motion was unanimously carried.

The CHAIRMAN, in reply, spoke of the difficulties against which the directors had had to contend, and said, that though it was not in the power of men to command success, they would do their best to court it. The proceedings then terminated.

WIGAN COAL AND IRON COMPANY.—From the half-yearly report of the directors of this company, just issued, it appears that the output and sales had been very materially diminished owing to the colliers having struck against a reduction in their wages. Prices were entirely abnormal owing to the output being stopped throughout the district. The company's ironworks were stopped for the greater part of the time during which the strike lasted, and trade had continued very dull and unprofitable, although the furnaces were stopped for so many weeks. During the greater part of the strike, and up to the end of the year, the steelworks were also stopped. Trade was so dull and prices were so unprofitable that it was not possible to resume work at the close of the strike except at a heavy loss. The accounts for the half year ending December 31, 1893, showed a profit of £12,326 on the whole operations of the company for the half year. The sum of £7901 was brought forward from the last half year, making together a sum of £20,227 available for dividend, and the directors recommended that a dividend of 2 per cent. per annum, free of income tax, be paid, which would absorb £18,097, leaving £2130 to be carried forward.

## GOLD MINING IN SOUTH AFRICA.

### THE VIEWS OF MR. THOMAS RICKARD.

WRITING to the *Pall Mall Gazette*, Mr. Thomas Rickard says:—"Important as may be the newly-discovered gold regions which the Anglo-Africans and Anglo-Australians are painting orange on their large maps, no evidence has hitherto been produced that they are likely to be of an epoch-making nature, or are calculated to produce any great economic revolution, similar to that which followed the exploitation of the great Pliocene gravel deposits of California and Australia. Johannesburg remains far and away the most notable discovery of the last forty years, and in many respects the most wonderful the world has ever seen; but even Johannesburg, with its annual output of about £6,000,000, has great leeway to make up before it will have attained the maximum production of the great gravel mining epoch in 1853, when California alone produced £16,000,000 and Victoria nearly £13,000,000. Whether the gold output of the Randt will ever attain to the proportions indicated by these figures or not it is not the question under consideration; at all events, it is still strongly in the ascendant, and likely to continue so for many years to come. The wonderful predictions with regard to the prospects of the Randt, though hazardous, are by no means irrational. Hazardous they doubtless are, because of the varying nature of the beds and of the degree of gold impregnation, and also because the pursuit of the beds in their lower reaches will necessitate engineering of a character more than usually daring and expensive, the incidence of which has yet to be ascertained.

"I have said that the recently discovered gold fields in the different parts of the world present nothing comparable with the early discoveries of California and Australia; and it may be said with equal truth that among the startling discoveries of South Africa, the Randt, with its grand cordon of 40 to 50 miles, stands alone, not only in its great expansiveness, but also because of its peculiar geological character; it is, in fact, totally distinct from any previously discovered gold deposit; never before was gold mined in this manner, in a distinctly aqueous deposit, and it constitutes one of the grand surprises of the Dark Continent. It is, perhaps, not too much to say that the status of the gold market, in the immediate future, will greatly depend on the extent of these peculiar auriferous beds discoverable in South Africa. It is a significant fact that evidence is yet wanting of the discovery hitherto of ground of this peculiar character in the vast newly-acquired territories in the North, and probabilities would seem to be rather against it.

"Apart from the development on the great synclinal of the Randt, which of itself presents wonderful potentialities (in the Randt I include all the region from Klerksdorp to Pretoria), present appearances point to the Lydenburg district as the most likely theatre of mining of the Johannesburg type in the future. This district, the scene of the first operations, long thrown into the shade by the superior fortunes of Johannesburg, has of late gradually come to the fore, and the discoveries of the last four years seem to assign to it a place in the South African mining industry second only to the Randt itself; here, as at the Randt, but not as at Barberton and in Mashonaland, the gold is proved to exist in widely extending stratified formations, nearly flat, or only slightly inclined. At three different points within a distance of about fifteen miles—i.e., Pilgrim's Rest, the new Clewer Estates Company's mine, and Frankfort, the Lisbon Berlyn Company's mine, very large and rapidly increasing tonnages of ore of good mill average are won by easy mining, and under conditions very similar, and economically not inferior to those of the Randt. In one important particular this district has the advantage over the Randt—the angle of dip is small, and the beds can be pursued without encountering the difficulties incident to deep working.

"It is owing to quite new discoveries of these auriferous bedded formations that the Transvaal Gold Exploration and Land Company (Limited) has extricated itself from a difficult and relatively hopeless position, and entered upon a career of prosperity.

"The New Clewer Estates Company's history is similar, and the Lisbon Berlyn Company's Frankfort Mine, situate some eight miles to the north, on the same formation, has lately made great progress in opening up reserves of ore for the Cyanide Reduction Works, the first installation of which is about to be put into operation. At this last mine the gold occurs in beds at three distinct horizons.

"The above-named mines, though the principal, are by no means the only ones in this district, where, during recent years, important bedded auriferous deposits have been discovered, and from knowledge I have gained on the ground I do not think there can be any doubt that discovery will follow discovery in rapid succession, and that great activity will soon focus itself here, something in the same way as at the Randt.

"While it is well to bear in mind, as regards South Africa, that all that glitters is not gold, and that all that is auriferous is not the Randt over again, it is equally necessary, in all forecasts as to the Randt itself, to remember that these conglomerate formations, though bedded and therefore, in a manner, continuous, are more than almost any other rock formation subject to alternations and to variations in area, thickness, and compositions, as well as in degree of gold impregnation. This, together with special engineering considerations, must greatly qualify all estimates of the probable result of the pursuit of these auriferous beds into any not actually proved regions of the field.

"Viewing the question under a still broader aspect, one may ask, in the light of geological probabilities, as illustrated by the Randt and the Lydenburg discoveries, what of the immense region of ground occupying the interval between these districts, throughout which the same rock formation is continuous, namely, the so-called 'Lydenburg beds'? Indeed, what of the vast region in general, occupied by these beds, which, beginning 70 miles to the west of Kimberley, extends to the De Kaap Valley, a distance of 350 miles? It will be objected that the assumption of the continuity of gold-bearing beds throughout this region, as if it were a coal field, is most hazardous and speculative, and so, indeed, it would be; on the other hand, with discoveries of the nature lately made in the Lydenburg district there would be startling inconsequence in the assumption that the gold is limited to the Randt and to the Lydenburg portions of the formation, whose gold deposits have been exposed by mere geological accident. There can be no rational doubt that portions of this area, perhaps large enough to contain many Randts, will prove auriferous and come within the domain of the practical as mining fields; indeed, I think it is pretty safe to predict that within a few years, shafts and borings will be made, in reliance upon conclusions like the foregoing. At all events, I do not hesitate to commit myself so far as to say, Give me this corner of underground South Africa, and I will not envy the explorer of the Cie-Zambesian country."

## THE EDITOR'S LETTER BOX.

*We wish it to be understood that we do not hold ourselves responsible for, and do not necessarily endorse, the opinions of correspondents. All communications must be accompanied by the names and addresses of the senders, though these need not necessarily be published.*

### GOLD EXTRACTION.

TO THE EDITOR OF "THE MINING JOURNAL."

SIR,—Under the above title there appears a long letter by "Scrutator" in your issue of 17th inst., in which your correspondent makes a feeble attack on Mr. J. B. Hannay's electro-cyanide process. "Scrutator" begins his laborious letter with a wail over his own misfortunes in connection with gold mining enterprises; an admission of his own incompetence to judge of the merits or demerits of the undertaking whereby he "suffered from the disagreeable operation of gold extraction from his pockets." How, then, does he establish his title to criticise the work of an eminent chemist like Mr. Hannay? Let "Scrutator" come out of his shell and not conceal his identity under a *nom de plume*; we will then have an opportunity of judging of his metal and deal with him accordingly. Perhaps your correspondent is the same gentleman who recently penned an adverse article for a scientific journal, and subsequently expressed regret for having done so. In any event "Scrutator" would do well to make the acquaintance of the directors of the Australasian Ore Recovery Company (Limited), as they would doubtless avail themselves of his wise counsel, but I must point out to him that he is wrong in stating that sand or gravel was used on the occasion of the Press "demonstration"; there was no need to do any such thing, seeing we had several tons of refractory ore on the premises. As a matter of fact the ore treated on the occasion referred to was the well known "Reedy Creek," which has baffled all other processes, and the result was an extraction of 90 per cent. of the precious metal. As for your correspondent's challenge in regard to the validity of Mr. Hannay's patents, that may be well passed over, as we, fortunately, possess the written opinions of the most eminent men in London on that point.

In conclusion, it appears to me that your correspondent knows as much about gold extraction as he does of the position of an assayer to the Bank of England, but as I have already suggested, let him disclose his identity and I will hand him over to one more able to deal with his "inspired" vagaries than myself. I use the word "inspired" advisedly, as from the tone of his references to the MacArthur-Forrest process throughout his long letter it is evident he is an advocate of that process, but it may interest him to know that we have successfully treated refractory ores which have been tested by the MacArthur-Forrest people at their own works, and found to be entirely beyond the powers of their process.—I am, Sir, yours, &c.

ALEXANDER CRUCKSHANE,

73, Basinghall-street, February 22.

TO THE EDITOR OF "THE MINING JOURNAL."

SIR,—I read with much interest "Scrutator's" letter in your Journal of last week concerning the electro-cyanide process of gold extraction claimed to be the invention of Mr. J. B. Hannay. Like the writer of that letter, I may say that I, too, received a copy of the *African Review* containing the article to which he drew attention, but containing in addition an enclosure in the form of a reprint of a number of laudatory criticisms from the Press as the result of the demonstration of Mr. Hannay's alleged discovery given in July last. This circumstance at once removed all doubt from my mind as to the source whence the newspaper came. The trick is an old one, and too obviously transparent. When analysed what do all those criticisms amount to? Nothing; but, in many cases, a clumsy *réchauffage* of Mr. Hannay's own printed description of his process circulated among the representatives of the Press on the occasion referred to. I do not think that journalists would willingly to the public detriment misrepresent the merits or demerits of any invention. To their credit, it is spoken, they usually describe honestly and impartially whatever they may be called upon to do. Particularly is this the case when they handle subjects which come within the range of their knowledge. But, like the rest of us, they are not all Admirable Crichton's, and in nine cases out of ten when they are asked to pronounce judgment on complicated mechanical and chemical combinations they are necessarily and absolutely at the mercy of specialists for their information. Under these circumstances it is very natural that Mr. Hannay and those who are, in common with himself, interested in the sale of his patent, would not cry stinking fish, and hence, I repeat, that there is not one of those criticisms worth the paper which it is written upon. Mr. Hannay, sounding the praises of his own process, speaks in each of them in only modified tones. Yet it is upon the strength of this imperfect and one-sided "inspiration" that Mr. Cruckshank is evidently trying to "boom" the patent; and the public is invited to invest its capital in the purchase of it. This is one of the most regrettable features of modern journalism, and lends repeatedly to the greatest public mischief and misapprehension.

Knowing a little about the various processes for gold extraction already before the public, I fully endorse what "Scrutator," in effect says, that there is no novelty in what Mr. Hannay claims to be his invention. It was, in my opinion, anticipated in every particular by MacArthur and others, as well as by Molloy, a fact which I have no doubt Mr. Bryant and those associated with him in attempting to work the patent in Australia will in due course find out to their cost, as "Scrutator" plainly indicates. I should like, moreover, to know who is Mr. Cruckshank? If I mistake not, he also is of white lead fame, and was associated with Mr. William Elmore in promoting, some years ago, a company for the manufacture of white lead by a process patented by one Ralph Waldo Emerson McIvor, sometimes styled "Dr." or "Prof." McIvor. The assets of that concern have since passed through the hands of the liquidator. The company has ceased to have a local habitation and a name, and like many another much vaunted enterprise has left only a bitter recollection amongst those who were foolish enough to invest their money in it.

LUX.

### THE GRAVEL GOLD MINES.

TO THE EDITOR OF "THE MINING JOURNAL."

SIR,—Since writing my letter, which appeared in your issue of the 17th inst., I have received a card from the secretary of the company, which informs the shareholders, first, that it has been proved that the gravel banks will pay a fair profit; and, secondly, that the banks are improving in value as the washing proceeds.

Now, unless the directors are possessed of information which is kept back from the shareholders, I can demonstrate that both these statements are exaggerated both in substance and in fact. I will deal with the second statement first. In July, 1893, the shareholders are informed that £800 worth of gold had been the

result of 740 hours washing. This means £1 1s. 7d. per hour. In September, 1893, we are told £1000 has been obtained in 1150 hours. This gives 17s. 4d. per hour.

In January, 1894, we are told that £900 has been obtained in 950 hours, which gives 18s. 1d. per hour. Thus, if we average the last two runs, it only gives 18s. 2d. per hour, which is about 15 per cent. less than was obtained during the runs previous to July, 1893, and thus statement No. 2 is shown to be absolutely without any foundation in fact. As to statement No. 1, the September card says the profit on that run was £400, and I am satisfied that if any other run had given better results we should have heard of it. Taking this run as a fair average—and I am sure it is above a fair average—we have £200 a month profit = £2400 a year, from which all directors' fees, &c., have to be paid, and this we are told is a fair profit on the £110,000 laid out on the mine.—Yours, etc., "P."

### CARATAL.

TO THE EDITOR OF "THE MINING JOURNAL."

DEAR SIR,—I think it is about time that the directors of this company gave some information to the shareholders as to their plans for dealing with the property. I have been told that Mr. Skertchly holds a very high opinion as to the value of this mine, and that the tailings might be treated at a profit. If a gentleman of his great experience has expressed such an opinion, I think the board ought to take some steps to carry out his ideas as to the proper mode of working the mine.

If they are doing so, they are most mysteriously silent upon the matter, and I think they should call a meeting of the shareholders at once, and give them an account of what the board are doing for their benefit. It is very certain that if we do not take possession of the mine, the creditors in Venezuela will do so for themselves. This is what was done in the case of the Cartago Company. Mr. Skertchly reported most favourably upon this property—in fact, the Old Tigre and Caratal Mines were bought upon his recommendation by that company. The shareholders refused to come into a proposed scheme of reconstruction, and, finally, the local creditors seized the mine, and formed a Venezuelan Company (The Columbia). I see by your columns of the 10th inst. a 16 franc dividend has been declared by this company. Now, if we do not want to cry out when it is too late (like the Cartago people are now doing) let us take the advice of Mr. Skertchly, and go ahead at once. Trusting this will stir up the directors to immediate action.—I am, yours truly,

"TIRED OUT."

### WHEAL UNY.

TO THE EDITOR OF "THE MINING JOURNAL."

DEAR SIR,—As the recent events connected with this mine have been creating such a stir, I wish to make it known that I have never had anything to do with Wheal Uny.—Yours truly,

W. T. WHITE.

## MINING NOTES. HOME, COLONIAL, AND FOREIGN.

THE annual report of State Controller R. L. Horton shows that the total bullion product of the mines in Nevada for the twelve months beginning October 1, 1892, and ending September 30, 1893, was \$2,501,169. Storey county is credited with \$1,270,008; Elko, \$188,729; Esmeralda, \$19,320; Eureka, \$371,562; Humboldt, \$9334; Lander, \$206,345; Lincoln, \$162,950; Lyon, \$35,134; White Pine, \$7865. This statement represents the bullion yield of ores. Following is the product from tailings:—Lincoln, \$5000; Lyon, \$66,691; Ormsby, \$133,713. The product credited to Ormsby and Lyon should be added to that of Storey county, as the bulk of the tailings worked in Ormsby and Lyon county mills represent the residue from the reduction of Comstock ore, and this swells the total bullion yield of Storey county to \$1,470,000. The *Enterprise* estimate of the total bullion product of Comstock for the year 1893, published in the issue of December 31st, included the twelve months from January 1st to December 31st. The statistics of the last quarter of 1893 not being obtainable until next month, the product of that quarter was estimated, and the total yield for the year placed at \$800,000. The total product for the State for 1893 was estimated at \$3,000,000 in the same statistical article.

CHAS. W. STICKNEY, of Ketchum, Idaho, has obtained a patent for roasting ores, says the *Scientific and Mining Press*. Claim.—1. The process of roasting ores and depositing the sulphur in a solid form by bringing steam in contact with the ore of a red or higher heat, agitating the ore, reducing the temperature of the gases, mixing them with a quantity of air sufficient for the oxidation of the hydrogen, but insufficient for the oxidation of the sulphur, and combining the oxygen of the air with the hydrogen of the gases by subjecting the mixture to the action of electrical discharges, substantially as described.—2. The process of roasting ores and depositing the sulphur in a solid form by bringing steam in contact with the ore at a red or higher heat, agitating the ore, reducing the temperature of the gases, mixing them with a quantity of air sufficient for the oxidation of the hydrogen but insufficient for the oxidation of the sulphur, and combining the oxygen of the air with the hydrogen of the gases by bringing the mixture to a red heat, substantially as described.—3. The process of roasting ores and depositing the sulphur in a solid form by bringing steam in contact with the ore at a red or higher heat, agitating the ore, reducing the temperature of the gases, mixing them with a quantity of air sufficient for the oxidation of the hydrogen but insufficient for the oxidation of the sulphur, combining the oxygen of the air with the hydrogen of the gases, and spraying the residual gases with a sulphate solution, substantially as described.

"AUSTRALIA," writing to the *London Globe*, says:—The Steiglitz gold field, about halfway between Melbourne and Ballarat, was some thirty years ago one of the richest in Victoria, but it was abandoned after a time, the diggers being attracted away to fresher and more sensational discoveries. To so low an ebb did the population sink that enough eligible men could not be found to fill the seats on the Steiglitz Municipal Council, and so the municipality was abolished by the Governor in Council, and Steiglitz suffered the indignity of being merged in the surrounding shire. It has been under this eclipse for more than ten years, but last year it suddenly revived in consequence of new golden discoveries by a small band of persevering miners, who had faith in the place and stuck to it all through. At the beginning of 1893 the population of Steiglitz all told was about 100; at the close of 1893 the place was once more a busy hive of industry, with close on 3000 miners at work, and doing well. This sudden access of population brought about a result that will interest Sir Wilfred Lawson and temperance people

generally. Two hotels sufficed to meet the modest requirements of the hundred inhabitants at the beginning of the year, and under the Local Option Act that is now the law in Victoria it has been found that the number of hotels in the place cannot be increased for a considerable time to come, notwithstanding the large increase of population. At first sight this would seem to be a great gain to the cause of temperance, but, as a matter of fact, the result will be exactly the reverse. What is known on all the Australian gold fields as "sly-grog selling" is inevitable under the circumstances. That is to say, in the absence of duly licensed hotels, one shop in every six will sell liquor to its known customers on the sly. The police, however vigilant, cannot stop this illegal trade, although they may secure an occasional conviction. But vigilance is not, as a rule, the characteristic of the police in this connection. Knowing that this illegal trade is being carried on, and that it is out of their power to stop it to any appreciable extent, they gradually come to regard it as an established institution, and even to fraternise with the people engaged in it when off duty. The present writer once made a journalistic tour of the Victorian goldfields, and repeatedly saw policemen in plain clothes drinking in "sly-grog shops." The moral would seem to be that people will provide themselves with liquor illegally if they cannot get it legally, and that Local Option in advance of the general public sentiment increases and intensifies the very evil that it seeks to minimise or abolish.

A good story (says the *Northern Territory Times*) comes from the Extended Union Gold Mine, and it is all about a Chinaman who attempted to steal the plates from the battery. It was at night time, of course, and the battery was crushing away serenely with engineer J. Turner in attendance. Presently Turner noticed something like a moving object near the tables, but not being suspicious to any extent merely took up a piece of dray iron and hurled it in the direction. Much to his astonishment up jumped a Chinaman, who made off as quickly as his pagan legs could carry him. Investigation revealed that under cover of the noise of the battery the Chinaman had impudently forced a lock with a crowbar, and he was proceeding to remove the plates when Mr. Turner's missile disturbed him. During the remainder of the night the plates were guarded by a man with a gun.

THE South Reef at the Village Main Reef Mine has now been successfully picked up on the other side of a somewhat serious downthrow fault which has been encountered on the drive east on the second level about 300 feet from the shaft. A winze was put down on the fault in the expectation of cutting the reef within 20 feet. Anticipation was, however, disappointed, and the intersection was not effected until 48 feet of sinking had been carried out. The main incline shaft has now been carried down to 65 feet below the second level, but no use will be made of this shaft for hauling purposes for some time to come, and, in the interval, it is intended to equip the present vertical shaft with a new hauling engine, sorting floors, &c. At the bottom, where the shaft is turned off on the incline, a small steam hoist is employed. At a later stage either an air or an electric hoist will have to be put in, preferably the latter, if a suitable type can be selected.

An outrageous piece of vandalism was perpetrated during the holidays at the Dagmar Tribune Company's mine at California Gully, says the *Australian Mining Standard*. The mine was idle from New Year's Day to 3rd January, and between those dates some person wilfully cut the whip rope in no fewer than three places. The offender evidently had some base design, for the rope in each instance was cut nearly through, little more than a strand being left uncut. Fortunately the miners on resuming work on the 3rd inst., observed the state of the rope. The men lower the tools by this rope, and if the damage to the rope had not been found out in time the probabilities are that the rope would have broken with the weight of the tools, and that the men would have been precipitated head foremost into the claim.

At Hillgrove the Sunlight Gold Mining Company are pursuing the even tenor of their way with fairly satisfactory results. The last clean up fell rather short of expectations, but the low yield was not regarded as possessing any special significance, owing to the large amount of mullock mixed with the stone produced from the principal stopes; 530 tons were crushed for a yield of 135 ounces 17 dwts smelted gold. At Baker's Creek the annual overhaul has taken rather more time than usual, owing to the necessity of putting in new foundations for the whole of the plant. The mine generally is looking very well. The West Sunlight battery cleaned up after a seven days' run for 150 ounces 14 dwts. gold from 210 tons stone.

MR. HERBERT LEWIS, M.P., having drawn the attention of the Home Secretary to the fact that a number of experienced Welsh miners are disqualified from obtaining positions as underground managers in consequence of their insufficient knowledge of the English language, Mr. Asquith has promised to redress the grievance, and arrangements have now been made for an interpreter speaking Welsh to attend the examination for second class certificates of competency for the Liverpool and South Wales mining districts.

QUEENSLAND produced over 800,000 ounces of gold last year, which is a good yield all things considered. Charters Towers maintains the same lead among the Queensland fields, having turned out gold to the value of a million sterling during the year. Rockhampton, with its famous Mount Morgan mine, came next on the list of course. There is said to be every prospect that the yield for the present year will show a considerable increase.

THE following appointments have been announced at the Mint:—Ewing Bowers, San Francisco, workman; P. F. Fitzgerald, Oakland, workman; Cecil Drake, Humboldt, watchman; Miss Daisy Smith, Siskiyou, adjuster; Miss Ada Rickard, San Francisco, adjuster; Miss Flora Vivian, Colusa, adjuster.

A MINER named Martin Riley had a narrow escape from death at Butte, Mont., a few days ago. He was ascending a ladder in the shaft, and had reached the 450 foot level, 200 feet from the bottom, when the ladder gave way. He fell 50 feet and struck on a piece of timber, and was saved from death, though seriously hurt.

MONROE THOMPSON, owner of the mine on the Swasey place, who has been experimenting on an electrical process for working ore, says the Redding *Free Press*, has succeeded in making the process do the work required, and will immediately erect a plant on his mine. The ore is base, but very rich. If the plant is a success, it will open up a new era in working the base ores of the county.

A DISPATCH from Port Townsend, Wash., says a chlorination vat at the Alaska Treadwell mine, Douglass Island, was robbed of \$10,000 in gold. The robbery was committed at night and is enveloped in much mystery. As customary, water was turned on in the vat, so that the gold might separate from the quicksilver and refuse. The following morning the water was drawn off and the vat was empty.

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It is not intended only to negotiate the sale of an entire property but interests in such may be sold or money obtained for development work.

This Company especially solicits the business of making reports or examinations for non-resident mine owners on any of their mines in the United States, and obtaining special information as to their condition and so forth (said reports being confidential).

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LONDON: FEBRUARY 24, 1894.

**THE IRONSTONE MINING INDUSTRY.**

A t a time when all branches of trade seem on the point of undergoing an expansion it is only natural that special attention should be given to any noticeable recovery in the ironstone mining industry. More than other forms of raw material, the iron ore produced at home and abroad, is peculiarly affected by improvements in the higher strata of the metallurgical trade, and if the imports of foreign ore and the output of native stone show signs of activity it is a convincing proof that the general tone of trade throughout the country is more satisfactory. This trustworthy barometer of the commercial position is susceptible mainly from the fact that apart from ironstone being the first material in request by finished ironmakers, it has not such a tendency to accumulate in unwieldy stocks as is the case with fuel. The practice of allowing enormous quantities of coal to remain at the pit's mouth undoubtedly does

retard any revival in the colliery industry, as coal owners are often ready to dispose of these stocks at a much lower price than would be the case if the fuel were mined in proportion to the demand. This latter policy, however, though in many respects commendable, is yet hardly feasible under the prevailing conditions of the metallurgical industry, when ironmasters require heavy contracts executed within a brief period and at prices which shall not check any incipient stage of improvement. With ironstone, on the other hand, the situation is more in favour of the mineowners. Supplies are sufficiently abundant and easy enough to preserve to enable them to fulfil as many orders as may be forthcoming, and the prices obtained for ore are generally in direct ratio to any improvement in trade. Under these circumstances, we may look forward with some feeling of confidence to more prosperous times for the home ironstone mining industry, which, unfortunately, has for many years past been in anything but a flourishing condition. Like some other industries, it has had to give way in no small measure to the progress of metallurgical science, which has benefited foreign trade probably to a greater extent than our own. Victory is not now always given to the country possessing the most metalliferous wealth, but is secured equally by the country that knows how to take the best advantage of its natural resources, even though these may be of moderate value. The discoveries of Messrs. THOMAS and GILCHRIST have practically placed the different iron-producing countries upon an equal footing, and have franchised those European consumers who formerly had to obtain their supplies of iron ore from England. It is thus that we have lost a splendid market in Germany, where the basic process, which has enabled makers to utilise native ores, has undergone a greater development than in any other country. This, however, is by no means an unmixed disadvantage for Great Britain, as it is obviously contrary to the economic interests of this country to supply foreign rivals with the sinews for carrying on their industries when the superior qualities of ore can be utilised at home. At the present moment there seems a possibility of native ironstone being employed in the native iron making industry more extensively than heretofore. There is a perceptible brisker demand for iron ore, and prices are improving all round. In Cleveland especially, the tendency is distinctly in an upward direction, and some heavy deliveries are being made to Scotch consumers. With a continuance of the more confident tone in the finished iron trade, which seems likely to develop into a genuine revival, we may see very shortly a great deal of activity in the native ironstone mining industry.

So much having already been done by science for the benefit of the foreign iron trade, in allowing makers to use the enormous quantities of poor ore in their own districts, it is not unnatural that those interested in the ironstone mining industry at home should look forward with some impatience to a continued development of scientific progress which will still further add to the utility of native mineral. Metallurgical chemists and scientists have, indeed, completely changed the features of steel making since the discovery of the basic process, and during the past few years there has been quite a revolution in metallurgical practice. The old race of "rule of thumb" iron producers were among the first to appreciate the connection between chemistry and iron-making, but they left it to their successors to carry out the relationship to its logical termination. Even now we are only upon the threshold of the changes that are certain to take place in iron manufacture, and the results already attained by the aid of chemistry give excellent promise of yet greater economic achievements in the future. The partial elimination of phosphorus and sulphur from iron ore has done more than anything else during the long period of dull trade to enable producers to make a profit out of the manufacture of iron, and there is every reason to believe that we are on the point of seeing this problem completely solved. The researches of Mr. E. H. SANITER, of Wigan, have shown that it is quite possible to eliminate phosphorus from Cleveland ore by means of a mixture of calcium chloride and lime, and now a similar process is said to have been successfully tried at the Eston Works of Messrs. BOLOCKOW, VAUGHAN, and Co. Though too much may probably have been made out of these experiments in alleging that the well-known firm had carried them out personally, and was laying down a new plant for the manufacture of steel plates and rails from Cleveland ore, it is yet likely that they mark a distinct stage in the progress that is being made in the purifying of native ore for the manufacture of superior steel. Judging from past results this would seem to be perfectly feasible, and the way is already open for the larger employment of Cleveland ore for steel making. The possibility of the Cleveland ironstone industry reviving under these influences was recently referred to by Sir JOSEPH PEASE, who can speak with authority upon anything connected with the metallurgical trade in the North. It was with regret that he saw such a heavy increase in the imports of foreign ore, and hoped that the new processes for purifying Cleveland ironstone would open up a brighter condition of things in our own mining industry. It is difficult to see how this competition of foreign ore can in any way give rise to forebodings among those interested in the welfare of Cleveland ironstone. With an improvement in trade, such as now seems imminent, there would certainly be a heavy demand for native ore, and this would increase to a considerable extent in the event of the phosphoric ironstone being so far relieved of its impurities as to allow of its general employment in steelmaking. The hope of Cleveland ironstone seems, therefore, to lie in the immediate future. In the meantime, it is certainly to the advantage of the finished iron trade that consumers can obtain abundant and cheap supplies of ore from Spain, and in relying so much upon the Bilbao deposits this country is practically in no way tributary to another country for its raw material. The Spanish mines are worked largely with the capital of British ironmasters, and while freights are so low British ships are able to bring the ore to northern ports very

cheaply. It is this interest of British ironmasters in the Bilbao mines which will prove the most serious, and, it is to be hoped, the only stumbling block to the recovery which is now taking place in the home ironstone mining industry.

Ironstone mineowners must base any estimate of a future improvement upon an increase in the home demand rather than upon the larger buying of foreign consumers. Except in the case of Italy, which is still a good customer for Cleveland ore not one of the European countries is now tributary to Great Britain for its mineral, and they are all now utilising the inexhaustible deposits of ore that have been opened up in nearly every part of the Continent. The example of Germany in manufacturing enormous quantities of steel by the basic process is being followed more extensively in Belgium and France, where the practice of pig iron production has, during the past year or two, been much improved upon. One noticeable advance has been made by Mr. G. PUGH, the manager of the Halanzy furnaces, which are situated on the borders of Belgium and Luxembourg. By a new disposition of his furnaces Mr. PUGH is able to produce excellent pig from a highly silicious and friable mineral that had hitherto been quite worthless, and as there is an abundance of this mineral in the district the value of the new mechanical arrangement which has permitted of its being smelted cannot be over-estimated. These furnaces, as well as all the other new ones built in France and Belgium, are of great capacity, as the necessity of adopting every expedient during the long trade depression to secure economical results compelled proprietors to erect furnaces of large dimensions. It is found that with a heavy output from each furnace the cost of production is lower, and the profits are consequently more considerable. This policy is now being generally adopted, with the result that during the present year the Continental output of pig iron will largely increase, and as the position of the industry is a satisfactory one, the prospects are most encouraging. With the lapsing of the THOMAS patents on the Continent the production of steel is undergoing a remarkable extension, and this has opened up a new scope for the consumption of the vast stores of mineral in Belgium. Apart from this activity of ironstone mining in the chief metallurgical countries, and of the further development which is likely to take place at Bilbao, there are other deposits of mineral that are only awaiting the aid of capital to form centres of industrial activity. The value of the Gellivara ore has long been proved beyond all doubt, and there is an abundance of this mineral in the northern provinces of Sweden that could be delivered in England at a price quite as low, if not lower, than that paid for Bilbao ore. The facilities for transport during the open season are exceptional, as the port of Lulea is within comparatively easy distance of the most prolific ironstone mines, and with the establishment of a regular service of vessels the cost of transport would be very small. Whether or not these deposits will be worked at no distant date to the extent that is justified by their richness, it is certainly reassuring to British ironmasters to know that apart from the native ores and those of Spain there is sufficient mineral within reach to prevent the remotest danger of a mineral famine. In other countries also, and notably in Russia, there is plenty of ore to be opened up by the railways now in course of construction, and this will form the groundwork of an iron making industry that seems destined to become a large and flourishing one. With trade improving in nearly all its branches it may be reasonably expected that ironstone mining will experience an immediate revival of activity, and this is of importance not only in view of its bearing upon the finished iron trade, but also by reason of the considerable amount of British capital that is sunk in the industry.

## NOTES AND COMMENTS.

THE directors of the Mysore Gold Mining Company have declared a dividend of 3s., making in all 50 per cent. for the year. This mine is in an undoubtedly promising position, yet the public seem to regard it with feelings of uncertainty. The share are dull, yet there is no reason now why this should be so. It is true that at one time the prospects of the mine looked doubtful, but the clouds which threatened have now passed by, and a brighter future seems in store. It was not so long ago when it held the premier position amongst Indian mines. If it does not hold it still it is, at any rate, second on the list, and that is a position which many mines, now regarded with greater favour in the eyes of the public, would like to hold. Although Indian mines have of late come more prominently to the front, and deservedly so, it cannot be said that undue influences have brought them there. They have pushed themselves forward by their own merit, and a position occupied by such means is more sure of permanency than if due to forced circumstances.

THE latest reports from the Gold Fields of Mysore Company's mining and prospecting operations will be read with special interest in view of the rumour which has been current for some days that a new company is to be formed forthwith to acquire and work the Oriental lode in the Golconda Block. The very successful operations which have been carried out for some time past in this block in connection with the well-known south shaft will be familiar to all our readers. This shaft has attained a depth of about 480 feet, and has, we find, on reference to our file, a lode in the bottom 2 feet wide, worth 1 ounce 2 dwts. of gold per ton. Levels north and south at the 480 are being extended from the shaft in very good ore. The north driving, 3 feet lode assaying 15 dwts. The south level, 53 feet in length, is in a lode 1½ foot wide, assaying 1 ounce 3 dwts. 14 grains per ton. At the 380 level drivings north and south, aggregating over 300 feet, have been put out in a very fine lode. The north level,

according to latest published advices, is in a lode 1 foot wide yielding 1 ounce 18 dwts., the south level having a 3 feet lode, worth 1 ounce 9 dwts. 23 grains per ton of quartz. It would appear, therefore, that a quantity of good reserves must be opening up here, and we are not surprised that in view of such excellent prospects it is contemplated to form a company to vigorously work this ground. We have only space to remark that the Gold Fields Company's prospecting works are opening up several exceedingly promising points giving assays of 1 ounce up to 2½ ounces of gold per ton in the blocks in the immediate neighbourhood of Golconda Block.

THERE is one particular point in the latest report from the Oregum mine which has excited some attention this week—we refer to the discovery of the fold in the 215 level north of Wallroth's shaft, the lode being 1 foot 3 inches wide, assaying 15 ounces 19 dwts. 21 grains of gold per ton. The importance of this discovery seems to lie in the enhanced prospective value it gives to the mine, assuming that there will be a repetition of this rich fold in the deeper levels. We do not venture to predict, but we do not see any geological reason why it may not occur.

To the untechnical outsider the huge salaries paid nowadays by gold mining companies for efficient mine managers and consulting engineers must frequently appear unjustified. There is, however, no department of human activity in which the "two ways of doing it" produce more striking differences than the auriferous quartz treating industry. One has only to compare the cost of mining and milling at mines where adequate technical supervision has secured efficient machinery and proper methods, with others where a lower standard of skill is manifested, to fully appreciate this. Some of the gold mines in the United States are paying dividends upon ore ranging as low as 4 dwts. to the ton. The Treadwell Mine, on Douglas Island, Alaska, is said to obtain gold more cheaply than any other in the world. It is very well situated for cheap working, as the mill is driven by water power, the mine is dry, and the ore has only to be quarried. Ships also can discharge within 400 yards of the mine. However, the ore is only 8 dwts. to the ton, and the profits obtained are mainly due to the employment of every possible labour-saving appliance. There are 240 heads of stamps at work, and the ore is extracted and milled at a cost of only 6s. per ton. Some of the mines under British management in Australia and elsewhere are not, however, inferior to the best equipped American mines.

THE new electrical rock drill, noticed in our columns of today, of which, personally, we know very little, may at least serve a useful purpose in reminding us that a moderate and judicious introduction of improvements into existing plants will be very beneficial to any industry. There is no reproach implied in the assertion that Englishmen, as a nation, are, in all branches, of their national, social, and commercial life, extremely loath to exchange the old fashion for the new. Much can be said in emphasising the possibility of disadvantageous innovation. Nevertheless, it is easy to see that a tenacious holding to the present order of things may be instrumental in preventing an advance into more prosperous and successful days. Following this train of thought, it is pleasing to remember that the introduction of electric plants into mines is a thing already familiar to the professional mind. We remember to have heard some very appreciative and just criticisms passed upon them by mining men in a way to show that prejudice counted for nothing in their judgments. The verdict seems often to be that the difficulties in using electricity as a power for working mine machinery are sufficient at least to leave the question and its general advantages still in the area of debate.

THE settlement of New South Wales has not been affected by the gold discovery to the same extent as that of Victoria, yet the number of persons engaged in actual search for the precious metal was at one time considerable. This number has gradually decreased, as the fields have been despoiled of the treasures contained in their easily worked alluvial deposits. The abandonment of a gold field is not, however, always a loss to the country. After the excitement has died out, the digger makes room for the agriculturist, and resources of a more permanent character are developed in parts of the colony which, but for the prospector, would have been unknown, and, but for the farmer, would have remained a wilderness. Gold mining now requires the expenditure of capital for the erection of plant and gold saving machinery; and the miner, whose stock-in-trade of gold-digging appliances consisted solely of a pick, a shovel, and a tin dish, has had, in the great majority of instances, to seek other fields of labour. Still, the mining industry of New South Wales is in a very flourishing condition, and maintains in employment a fair proportion of the people of the colony. During the last few months several hundreds of the unemployed have been assisted by the New South Wales Government in proceeding to districts where gold is known or supposed to exist, and with such success that considerable numbers are making a fair living by fossicking for the precious metals, a few finding payable ground. Mining is carried on both on private property by the owners, and on lands leased from the State; most of the principal coal mines belong to the former category, while the leading mines for other minerals are on lands leased under various sections of the Mining and Lands Acts. The area of freehold land devoted to mining purposes is not known; the area of State lands held under the various Acts was 154,450 acres, of which 35,655 acres were within reserves, and 118,798 acres were outside reserves; there were also 12,161 acres held under application to lease. During 1892 there were 224 applications dealt with for permits to search and dig for gold, 181 of which were received in that year. The revenue from mineral leases and licenses, &c., was £233,349, and the royalty on reserved minerals amounted to £10,533.

FRENCH investors have been very chary for a long time past of dabbling in South African gold mining shares. About four years ago they showed quite a remarkable enthusiasm for anything connected with the Transvaal mines. The English companies were then reported to be making enormous profits, and French capitalists feared that unless they acted at once they would be unable to get anything out of this Tom Tiddler's ground. Consequently, the Champs D'Or Company was formed, and for a time it seemed as if the Gaul had really secured a very profitable claim on the Transvaal reefs. Interest in gold mining enterprise, however, began to wane perceptibly when it was found that all that glittered in the Transvaal was not gold, and the failures resulting from mismanagement cooled this fever of enthusiasm into a feeling of distrust. Any concern bearing an English name was looked upon with suspicion, and no more capital could be secured in France for gold mining purposes. This indifference is only now giving way to a revival of interest in the Transvaal. The enormous gold-producing returns and the profits secured by English companies have awakened a desire on the part of French investors to take another share in the Transvaal mines. With this end in view a Société d'Etudes has been formed in Paris upon the lines of the trust companies, and it will take care that French interests in South Africa are not imperilled in the future by any such questionable practices as have made the Transvaal a bye-word in the past. The industry is, therefore, likely to be assisted very materially by French capital that will certainly be forthcoming in abundance for those concerns that are established upon an honest basis.

WEDNESDAY'S meeting of the Ophir Concessions and Exploration Company, though long drawn out, was not without its interesting or even its dramatic passages. The entry of Mr. Bridgeman at the moment when the resolution excluding him from the directorate was being put reached a point midway between comedy and melodrama. Two minutes, either to the good or to the bad, would have destroyed the interest attaching to the situation. As it was there was commingled mirth and excitement upon the entry, and when Mr. Woodbridge turned and faced his critics who had been severely commenting upon his actions in his absence, and when these abated nothing of their directness of expression before him, the cold, gloomy atmosphere of the Cannon-street Hotel seemed likely to become lit up with the fire of combat. However, the proceedings passed smoothly away, and the matter-of-fact questions of directors' fees and meetings of management gave way to descriptions of African scenery and suggestive references to mining possibilities. The vast tracts of undeveloped territory lying in Central Africa received an illustrative comment from Mr. Alford. There is no use, remarked that gentleman, pithily, in sending one man, whatever his scientific capacities may be, to look over a country four times the size of Europe. That is a view which can hardly meet with anything but full and entire acceptance at the hands of everyone who may give a thought to it. All the hyperbolical comparisons ever put into the English language would hardly sustain comparison with this crude statement of actuality.

A CORRESPONDENT, writing to the *Financial Times*, contrasts the present position of the Randt with its condition in 1886. He recalls the time when, in the latter year, the Government ordered a township to be laid out, and gave a portion of this "rolling, treeless plateau," the name of Johannesburg, after the president, Johannes Paul Kruger. In 1887 the reduction of ore was commenced, and mining operations were actively conducted, but in a most wasteful and primitive manner. The nearest railway was then 300 miles away, whilst the population did not exceed 2000 inhabitants. The vision which now presents itself is a city of 50,000 inhabitants, with business premises which would do credit to any town in England, and numerous beautiful residences. The city extends in an eastern and western direction for four miles, and is most fortunate in its location, being situated midway on the line of mining operations. Tramways, electric lights, and all modern improvements are present. Railway communication is made with Cape Town, and the journey to that place occupies fifty-seven hours. The railway to Delagoa, on the east, is progressing rapidly, and will be running before the close of this year. Johannesburg is growing steadily and in a most substantial manner. Numerous buildings are in course of erection, several of which will represent an expenditure of £30,000.

As evidence of the enviable position of the Randt, and of its ability to compare most favourably—if not, more favourably—with other leading gold centres throughout the world, the writer remarks that the strongest assurance of a continued increase in the output of gold lies in the fact that 6 dwts. ore can be treated at a good profit, and no one who has examined these ore deposits can doubt that the production of ore of that grade will last for the next 50 years. The auriferous deposits for a distance of 40 miles are almost uninterrupted, and their permanency to a depth of 2300 feet is established. He then repeats the fact with which all are so familiar, and which cannot be repeated too often, that the failure of so many companies is to be attributed almost entirely to inexperienced management; but it is gratifying he says, to see that those which have been supplied with new capital, and have placed their operations in the hands of experienced gold miners have in all cases reached a profitable basis. Shareholders can be assured of a satisfactory return provided their directors appoint suitable men as managers, and see that no structural or exploitation work is undertaken which, to complete, will more than exhaust the working capital. In those cases where there is not a sufficiency of funds to commence operations on practical lines, the property should be idle, for its value is enhancing and ample funds can be raised at no distant date.

THE paper which Mr. Joseph Garland read on Wednesday before the Institution of Mining and Metallurgy occasioned a longer, and, in some respects, more interesting discussion than has taken place this session in the Geological Museum. It was, as several speakers remarked, of a kind to carry the audience somewhat beyond the range of their ordinary experiences. New Caledonia is but little known to the profession, and the methods of working applied to its mines—the Governmental provision of convict labour, the unadvised means of transport—are somewhat exceptional, and likely to furnish a lesson, if only in contrast to mining engineers used to the best appliances of modern science. There was a disposition among some of the speakers to laugh at the simplicity of the whole operations as carried on in the island; but, as was clearly pointed out by more than one speaker, small mines cannot support elaborate plants, and the majority of mines are small mines. A desire to work upon an elaborate and imposing scale is common to most of mankind, but, at the same time, there are multitudinous instances where a simple and rudimentary plant fulfil the purpose much more satisfactorily from a business point of view, and these cases are too often left out of mind.

## OUR CITY ARTICLE.

FRIDAY EVENING.

### THE MINING MARKET.

An unsettled week.—Fluctuations in the South African Market.—Miscellaneous rally and relapse.

FLUCTUATIONS have during the past week been the characteristic of the Mining Market. This can be accounted for by a further disposition on the part of holders to take profits, and so dispose of their shares. Notwithstanding this, however, a considerable amount of business has been done in the South African Market, most of the favourites being in demand. Robinson has been well enquired for, the appearance of the mine being reported highly satisfactory. The lower-priced Kaffirs and land shares have displayed greater activity than the higher-priced, and in the latter, consequently, there have been some noticeable declines. Shebas have been a great favourite, and it looks very much as if these shares would continue to attract for some time. Chartered especially have shown an erratic tendency. They have rallied and relapsed with most remarkable persistency. In sympathy with them other land shares have improved and declined, so that it may be said that this market is in an unsettled state. A similar description might be applied to diamond shares. These have been somewhat dull and flat throughout the week. Amongst the leading Kaffirs the following have fallen to a more or less extent: Crown Reefs, Cities, Heriots, Jubilee, Jampers, Wolhuter, Wemmer, and Village Main Reef. The Miscellaneous Market has exhibited a much more active tone than the South African, although the slight disposition to yield from pressure of sales from some of the recent buyers brought a pause in the more active buying at the beginning of the week. The fortnightly crushing from the Aladdin's Lamp mine amounted to 820 ounces for 165 tons, which is in advance of expectation. Consequently the shares improved on the receipt of this, but later in the week, like the majority of other securities, they have, in sympathy with the prevailing tone, declined again. No great amount of business has been done in this market. The continued decline of silver has discouraged holders in Broken Hill Proprietary. We hear, too, of subsidence having occurred in the mine, which has led to an apprehension of diminished returns. The directors' half-yearly report, submitted at the meeting held on January 25th, at Melbourne, shows a net profit for the six months of £453,632, of which some £288,000 was distributed in dividends, and £30,000 added to the reserve fund. Indian shares have this week shown a better tendency. Nevertheless they have not been dealt in to any conspicuous extent. The Mysore dividend is regarded as a satisfactory one, and on the announcement of it, the shares naturally went up. The final batch of letters of allotment in the Western Australian Goldfields were posted to-day.

#### British Mines.

The Cornish share market, after remaining fairly steady through the week, closes dull and lower in sympathy with the further sharp fall in tin. Carn Brea dull at 13. Dolcoath have varied from 70½ to 69½, closing at 69½. Killifreth recovered earlier in the week to 76s., but have eased back to 73s. 9d. A few Polberros have changed hands at 14s. West Kitty have declined to 7½, and Wheal Grenville to 14s.—Risen: None.—Fallen: Carn Brea, 10s.; Dolcoath, 10s.; East Pool, 5s.; Killifreth, 2s. 6d.; Tincroft, 10s.; West Kitty, 5s.; Wheal Agar, 5s.; Wheal Bassett, 10s.; Wheal Grenville, 20s.; and Wheal Kitty, 2s. 6d.

#### South African Market.

A disposition to convert paper profits into cash caused a slight reaction in most of the Kaffir shares at the commencement of the week. Nevertheless, there was a strong undercurrent, and late in the day a rally set in, the close finding the tone much firmer. A relapse of ½ occurred in Crown Reef, whilst Cities, Langlaagte, New Chimes, Heriot, Nigel, Salisbury, Wemmer, and Stanhope recorded losses varying from 1-32 to 3-32. Glencairn and New Reits were also flat, but Ferreira and Jampers improved ½. The advance in Robinson amounted to ½. The lower-priced securities were more active. Amongst land shares a fair amount of business was done in Chartered, which at first reacted to 29s. 9d., but finished 30s. 3d., leaving the price 1s. 6d. down on the day. Consolidated Gold Fields, however, maintained their prices. Gold Trusts hardened, but Explorers, Bechs, and Oceanas were easier. An improvement took place in diamond shares, both De Beers and Jagers showing a recovery. An easier tone characterised the market on the following day, there being noticeable a further amount of profit-making though of a moderate character. New Primrose were most conspicuous, the shares advancing ½. Robinson improved ½, whilst advances took place in a number of others. New Rietfonteins were again flat. Heriots, Jubilee, Spes Bona, Langlaagte, and United Roodepoort likewise relapsed. Further business on a large scale was transacted in Chartered shares. Consolidated Gold Fields were also freely dealt in, but closed rather easier. Oceanas were flat, but Bechuanalands hardened. Diamond shares were unchanged. On Wednesday a slight reaction took place in the market. A decline of ½ occurred in Jubilee, Primrose receded to 4½, Moyer and Charlton to 4s., Durban to 5½, Langlaagte to 3 11-14, Wemmer to 4½, and Nigels to 2s. A firm tone continued in Crown, Robinson, Cities, Geldenhuys Estate, and South

Simmers, while Princess, Jampers, and Simmers rallied ½. Shebas likewise improved, whilst there was a further enquiry for Randfontein. Chartered gave way. After opening firm at 30s. 6d., a decline set in till the price settled at 29s. 3d. Consolidated Gold Fields reacted in sympathy. Oceanas declined nearly ½, whilst Exploring were flat at a loss of ½. Zambesi were likewise weaker. Sutherland Reef improved on favourable reports of the development of the mine. Further weakness was displayed in diamond shares, both De Beers and Jagers being lower. This market has since shown a slight reaction. Nevertheless, there is an undercurrent of firmness.

The following are the week's changes:—Risen: Aurora, 2s. 6d.; De Beers, 2s.; George and May, 2s. 6d.; Griqualand West, 2s. 6d.; Luipaards, Vlei, 1s.; New Belguim, 6d.; New Primrose, 2s. 6d.; Paarl Central, 6d.; Randfontein, 2s.; Robinson, 5s.; Roodepoort (Kimberley), 1s.—Fallen: Afrikander, 2s. 6d.; Balk Land, 6d.; Bechuanaland, 1s. 3d.; Central Montrose, 6d.; Chartered, 3s.; City and Suburban, 12s. 6d.; Consolidated Deep, 1s. 3d.; Consolidated Goldfields, 1s. 3d.; Crown Reef, 5s.; Geldenhuis, 2s. 6d.; ditto Main Reef, 6d.; Glencairn, 6d.; Heriot, 5s.; Jubilee, 5s.; Langlaagte, 2s. 6d.; May, 6d.; Moodies, 6d.; Mozambique, 2s. 6d.; New Chimes, 2s. 6d.; New Jagersfontein, 6s.; Nigel, 7s. 6d.; Oceanas, 7s. 6d.; Rietfontein, 5s.; Salisbury, 2s. 6d.; Sheba, 1s. 6d.; Silati, 9d.; South African Gold Trust, 1s.; Southern Land (10s. paid), 6d.; ditto, (fully paid), 1s. 6d.; Transvaal Estates, 1s.; ditto, Exploration, 1s.; ditto, Land (fully paid), 1s. 6d.; United Roodepoort, 2s. 6d.; Van Ryn, 1s. 3d.; Wemmer, 2s. 6d.; Witwatersrad (Knights), 6d.; Wolhuter, 2s. 6d.; Zambezia, 5s.

#### Indian and Miscellaneous Market.

The commencement of the week witnessed a slight reaction in this market, though the decline was not at all of a serious character. Considering the great improvement which had taken place during the previous week, it was not surprising, of course, that some reaction should happen. New Queen rose 9d. on a favourable telegram, whilst Don Pedro and Poorman were also in demand at better prices. Indians were steady. Idaho, Exploring and Broken Hill Props. remained firm. A much more active tone prevailed in the market on Tuesday, buoyancy being apparent in several instances. Amongst Indians, Ooregum advanced ½, Mysore Reefs 1s. 3d. to 1ls. 3d., and South East Mysore to 5s. 9d. There was a better tone for Broken Hill Proprietary, Don Pedro, and Gravel Gold. Idaho also improved, as well as Kaboongas. Copper shares were flat. On Wednesday fairly active business was transacted in this market. Amongst Indians, Mysore Reefs and South East Mysore were conspicuous. Champion Reef and Mysore Gold were not so well supported. Broken Hill Proprietary relapsed ½, and St. John del Rey 6d. Rio Tinto declined ½. Later, miscellaneous shares have been rather quiet, and a shade less business has been going on amongst them. The dividend being considered satisfactory Mysore Golds have rallied. Kaboonga have kept firm, but Aladdin and Broken Hill Proprietary have been lower. Although mining shares have been quiet to-day they show rather more strength than during the earlier part of the week.

The following are the week's changes:—Risen: Achilles, 1s. 3d.; Burm Ruby, 2s.; Day Dawn, 6d.; Don Pedro, 2s.; Mount Morgan, 1s. 3d.; Mysore Reefs, 1s. 6d.; New Queen, 6d.; Ooregum, 2s. 6d.; Ripan, 1s.—Fallen: Aladdin's Lamp, 2s. 6d.; Balaghat, 6d.; British Broken Hill, 6d.; British Broken Hill Proprietary, 2s. 6d.; Cape Copper, 1s. 3d.; Colombian Hydraulic 1s.; Craven's Caledonia, 6d.; Golden Feather, 6d.; Golden Gate (California), 1s.; Gold Fields of Mysore, 6d.; Libiara, 2s. 6d.; Mason and Barry, 2s. 6d.; Mysore West, 1s.; Nundydroog, 5s.; Ooregum pref., 2s. 6d.; Rio Tinto, 2s. 6d.; St. John Del Rey, 6d.; Tharsis Sulphur, 2s. 6d.; Dividends declared—El Callao, 9½d.; Broken Hill Proprietary, 1s.; and Mill's Day Dawn, 6d.

#### THE STOCK MARKETS.

##### Business quiet in all Departments.

To-day business has been quiet in all departments, although investment securities continue in demand. Consols have not moved. Home railways have had a fairly active appearance, but the changes are few and insignificant, with a rather weak tendency. Foreign stocks have been dull and heavy, but Italians and Guatemalas have both recovered a little. American railroads have been steady on the whole without any special feature, and the market is simply waiting to see how New York opened after the holiday.

#### THE MONEY MARKET.

##### Reduction of the Bank Rate to 2 per cent.

The reserve at the Bank is higher than it has been at any previous date, and the directors have decided to reduce their standard for discounts from 2½ to 2 per cent. Including £212,000 gold received from abroad, the stock of bullion held by the Bank in the week just ended expanded £777,075, and as the note circulation fell away £205,680, the reserve ran up £1,332,755 to £22,601,698. The previous record for the reserve was in September, 1879, when a total of £22,374,587 was reached; and if we deduct from the present total the £350,000 increase in the authorised notes resulting from lapsed or abandoned note circulations since November, 1889, we are even now short of 1879, although the actual amount is larger than then. Public deposits rose £1,415,430, through the tax payments, but the other deposits, notwithstanding, increased £26,540, nearly half a million having been borrowed from the Bank. One usual table is appended:

	ISSUE	DEPARTMENT
Notes Issued	£14,166,880	Government Debt ..... £11,015,100 Other Securities ..... 5,704,900 Gold Coin and Bullion ..... 27,662,880
		—
	£14,166,880	£14,166,880
		244,166,680
		BANKING DEPARTMENT.
Proprietors' Capital	£14,553,000	Government Securities ..... £8,938,583 Rest ..... 3,532,037 Other Securities ..... 24,039,311
Public Deposits	9,501,883	Notes ..... 20,218,610
Other Deposits	27,866,018	Gold and Silver Coin ..... 2,383,088
Seven Day and other Bills...	171,244	—
	£25,624,192	£25,624,192

The return shows the following changes when compared with the previous statement:—Circulation Issue (Increase), £1,045,550; Circulation Active (decrease), £205,680; public deposits (Increase), £1,415,430; other deposits (Increase), £26,540; Government securities (decrease), £250,000; other securities (Increase), £471,883; coin and bullion (Increase), £777,075; seven days' and other bills' (decrease), £3567; rest (Increase), £16,235; notes in reserve (Increase), £1,255,230; total reserve (Increase), £1,332,755.

To-day rates are easy at 1½ to 1¾ per cent., and discounts are quoted at 1½ to 1¾ for fine paper.

#### STOCK EXCHANGE SETTLING DAYS.

CONTANGO.	TICKET.	SETTLEMENT.
Monday, Feb. 26.	Tuesday, Feb. 27.	Wed., Feb. 28.
Tuesday, Mar. 13.	Wed., Mar. 14.	Thurs., Mar. 15.
Tuesday, Mar. 27.	Wed., Mar. 28.	Thurs., Mar. 29.
Consols, Thursday, 1st March.		

## COMPANIES AND THEIR DOINGS.

### Reports, Balance Sheets, Dividends, &c., of Mining, Railway, Banking, and other Companies.

#### MINING COMPANIES.

##### Langlaagte Royal Gold Mining Company.

THE following is the report of the directors, dated Johannesburg, January 3:—Your directors beg to submit their fourth annual report, together with balance sheet and statement of profit and loss account made up to 30th November, 1893, to be laid before the general meeting to be held on the 4th January prox.—Property. In April last, as you are aware, 14 claims adjoining immediately south were acquired, and in June a further level of 34 claims with valuable water rights were purchased, making a total of 141 claims now owned by the company.—Accounts. The annexed accounts show a profit on the year's transactions of £12,373 14s. 1d. after deducting the whole cost of development for the period under review. To this sum has to be added £44 ls. 2d. brought forward from last account, and £29 11s. received in excess for gold in transit, giving a total of £12,447 6s. 3d., which has been distributed as follows:—5 per cent. dividend, £7000; depreciation account, £3004 9s.; carried forward to next account, £2442 17s. 3d.; total, £12,447 6s. 3d.—Crushing. The battery has been working during the year 346 days, and has crushed 40,795 tons of ore, which yielded 16,940 ounces 11 dwts. bar gold, an average of 8·30 dwts. per ton, and of 3·04 tons per stamp in 24 hours.—Cost of working. The average cost of working for the year, including amounts written off for depreciation, is 26s. 6d·2d. per ton on 40,795 tons of ore milled and milled (15,190 tons main reef, 20,023 tons south reef, and 5582 tons red reef), and the value realised is 30s. 5·39d. per ton, leaving a net profit of 3s. 10·77d. per ton.—Mine. A large amount of development is being carried on in preparation for the larger mill, and from the manager's reports we have every reason to believe that the mine will give excellent results.—Mill. Your directors have decided to increase the stamping power to 80 head of heavy stamps. At the present time the 40 light stamps are in process of conversion to heavy. Upon completion of this the erection of the extra 40, which are now on the ground, will be started. During April the whole 80 should be at work.—Tailings: As you are aware, the board have decided to erect a cyanide plant to treat 10,000 tons per month. A very large accumulation of valuable tailings are now in hand, and the treatment of these will form an additional large source of profit. Beginning of March this plant should be at work.—Management. The board are pleased to inform you that they have secured the services of Mr. W. Laurie Hamilton (well known in connection with the management of the New Primrose Company) as the general manager. Mr. Hamilton took charge on the 1st November last, since which date the development has been most rapidly pushed forward in anticipation of the larger mill.

##### Frontino and Bolivia Gold Mining Company.

The following is the directors' report:—The directors have received advices from the mines, dated 22nd December, 1893, and 7th January, 1894, also a letter from Messrs. Restrepo, dated 11th December. The statement for the month of December is as follows:—2314 tons produced bullion, 2005 ounces; also 49,956 lbs. of sulphurets valued at £854 18s. Estimated value of the gold and sulphurets, £5363 10s. 5d.; cost at the mines, Medellin, and in London, £3981 7s.; estimated excess of returns, £1382 3s. 5d. The above statement may be regarded as quite satisfactory, having regard to the interruption to work at Silencio, caused by the water, as explained in the letter of 22nd December, and to the fact that owing to the collapse through the wet weather of the ventilating shaft at Salada, all returns from San Joaquin became entirely stopped until the cross cut from the Salada new shaft should be communicated with the San Joaquin workings. On the 8th February a telegram was received as follows:—"Tigrito new mill started this morning.—Eustice." This indicates that the new mill was being supplied with ore from the several places mentioned in the letter of 6th December, set out in the last circular. On the 9th February a telegram was received as follows:—"Cross cut Salada holed.—Eustice." This indicates that a few days previously the San Joaquin workings had been communicated with the Salada new shaft. The first portion of the new 20 head Californian mill for Salada, in course of manufacture by Messrs. Fraser and Chalmers, was shipped on board the Royal Mail Steamer *Orinoco*, which sailed from Southampton on the 31st January. This shipment weighed 20 tons, and the remainder of the mill was shipped from Southampton on the 14th instant. The new steam hoist for Silencio, manufactured by Messrs. Harvey and Co., is completed, and will be shipped from Southampton in a few days. A temporary hoisting gear for Salada is being arranged at the mines for use pending the settlement of the question of whether a sufficient supply of fuel can be relied on for a steam hoist at that mine also.

##### El Callao Company.

The following is a translation of a circular addressed by the president of the El Callao Company to the agents in Europe, dated 5th February, 1894:—"The year 1894 opens with more hopeful signs than the last four in the history of the company. The construction of the railway, which will run through the Mucop Valley for a distance of seven kilometres, and the business that can be done with the proprietors of the present mines, and mines to be opened up in the valley, offers us a vast field for work which, under prudent administration, offers good prospects for the future. The first arrangement made is that contracted with the Colombia Company, which owns mines known to have been productive for over 25 years. Four companies were organised during this period to work the mines, but none of them ever did much to ascertain whether they contained rich lodes or only quarries that would not pay for their exploitation. The El Callao Company has made a contract for the repayment of any sum advanced up to 800,000 francs, plus 20 per cent. of the net proceeds. The work carried out up to this date clearly shows this to be a productive mine, and provides for the payment of a dividend for the month of January of 1 franc per share on El Callao Company, and a dividend of 16 francs per share on the Colombia Company. There may be months in which El Callao shareholders may be surprised to see that dividends are being paid to the Colombia shareholders and not to them. When this occurs it is because with 9000 Bolivars or francs, the Colombia Mine can pay a dividend on its shares of 1 Bolivar per share (thus, 4500 Bolivars for the El Callao Company and 4500 Bolivars for an equal number of shares of the Colombia Company) whereas the El Callao Company in order to pay a dividend of 1 Bolivar per share requires 257,000 Bolivars."

##### Oriental and Sheba Valley United Gold Mining Company.

The liquidators having obtained an allotment of part of the shares due from the Sheba Company, are now making a distribution of the said shares, par for par, to the assenting preference

shareholders of this company, and they expect shortly to receive the remainder of the Sheba shares, when they will provide for the claims of the non-assenting preference shareholders, and in the meantime make a distribution to the ordinary shareholders of one Sheba share for every seven ordinary Oriental shares. The fractions of shares must necessarily be subsequently dealt with, together with any additional cash distributions amongst the holders of ordinary shares which the liquidators may be in a position to divide.

#### Lisbon-Berlyn Company (Limited).

In consequence of the highly favourable reports of Messrs. Johnson and Sons, in London, and of the African Gold Recovery Company, in Glasgow, of their experiments with the Frankfort Theta ore by means of the cyanide treatment, some 90 per cent. of the gold having been recovered, and no difficulties in treatment met with, cable instructions have been sent to the manager at the fields to immediately pass this rich ore through the mill and the cyanide plant.

A dividend at the rate of 1 franc per share has been declared by the EL CALLAO GOLD MINING COMPANY, and is now payable at the office of Baring Brothers and Co. (Limited) against No. 6 Coupon at the sterling rate of 9½d.

A dividend at the rate of 16 francs per share has been declared by the COLOMBIA GOLD MINING COMPANY, and is now payable at the office of Baring Brothers and Co. (Limited) against No. 1 Coupon at the sterling rate of 12s. 9d.

The s.s. *Patience* sailed from Santander on Tuesday with a cargo of the SAN SALVADOR SPANISH IRON ORE COMPANY'S ore for Middlesbrough.

The secretary of the ISLE OF MAN COMPANY sold on Tuesday 100 tons of the company's ore at £7 2s. 6d.

The MYSORE GOLD MINING COMPANY (LIMITED), has declared a balance dividend for the year 1893 (free of income tax) of 3s. per share (subject to audit), payable March 14. This dividend will make the sum distributed out of the profits for the year 1893, 10s. per share or 50 per cent. upon the nominal capital of the company.

Warrants for the dividend of 10 per cent. declared by the SALISBURY GOLD MINING COMPANY (LIMITED) on November 30 last, have been posted.

Warrants for the dividend of 25 per cent. declared by the CITY AND SUBURBAN GOLD MINING COMPANY (LIMITED) on December 29 last, have been posted.

Letters of allotment and regret are being sent out to applicants for shares in the SILATI GOLD MINING COMPANY (LIMITED).

Advice has been received from the head office of the NEW CHIMES GOLD MINING COMPANY (LIMITED), in Johannesburg, that the 25,000 shares of the new issue, recently offered to the shareholders, have now been applied for, and will be allotted in due course.

WARRANTS for the NIGEL GOLD MINING COMPANY'S dividend of 10 per cent. declared December 29, 1893, have been posted.

The London agents of the NEW PRIMROSE GOLD MINING COMPANY (LIMITED) announce that the warrants for the dividend of 20 per cent. for the half year ending 31st December, 1893, have been posted. They also announce that letters of allotment and regret for reserve issue have been dispatched.

The NUNDYDROOG COMPANY (LIMITED) has declared (subject to audit) a balance dividend for the year 1893 (free of income tax) of 1s. per share on the fully paid shares and of 5d. per share on the shares on which 8s. shall have been paid, payable on March 20, 1894. This dividend will make the sum distributed out of the profits for the year 1893 2s. 6d. per share on the fully paid shares.

#### R A I L W A Y C O M P A N I E S .

##### Cornwall Minerals Railway Company.

The directors' report states:—"The accounts received from the Great Western Railway Company of the traffic for the past six months show a total gross receipt of £19,420 18s. 6d., compared with £21,264 0s. 9d. for the previous corresponding half-year, being a decrease of £1,843 2s. 3d. There is an increase of rather more than 1½ per cent. in the working expenses charged by the Great Western Company, and the net receipts amount to £8861 3s. 8d., being a reduction of £1129 10s. 3d. compared with the previous corresponding period. The directors do not feel themselves justified in accepting the accounts as rendered by the Great Western Company, and several questions of importance have been raised upon them. They, therefore, now only submit to the proprietors the figures as received—not as a final and accepted statement, but subject to adjustment when the points raised with the Great Western Company are disposed of."

**ANDREW KNOWLES AND SONS (LIMITED).**—Mr. Robert Millington Knowles, speaking from the chair at the ordinary general meeting of the shareholders in Andrew Knowles and Sons (Limited) described the prejudicial effects of the strike upon the affairs of the company. Small profits had been made at the commencement, and it was owing to this that they were able to offer the shareholders a dividend of 2 per cent. as during the stoppage the collieries had to be kept in order, water pumped, ventilation attended to, working places and wagon roads repaired, and in addition rents and rates had to be paid. All this was very costly, entailing an outlay of £17,000, but was necessary if the collieries were to be kept in a fit condition to resume work after the stoppage. At the commencement of the stoppage the company only had a stock of 85,000 tons in hand, and this they made the best possible use of, giving preference to their regular customers. The expenses of keeping the pits in order during the stoppage were paid for out of the extra price charged for the stocks over and above the prices they had been valued at, and he might add that the stock sold for £22,000 above the book value. In conclusion, the Chairman said it would be seen from the report that all old debentures held by the vendors had been paid off and new debentures to the amount of £125,000 had been issued, which were allotted to the shareholders only and considerably over applied for, the result being that now the whole of the property was in the hands of the company.

#### [Received too late for classification.]

##### THE NUNDYDROOG COMPANY (LIMITED).

6 and 7, Queen Street Place, London, E.C.,  
23rd February, 1894.

At a MEETING of the Directors, held this day, it was resolved:—

"That subject to audit a Balance Dividend for the year 1893 (free of income tax) of 1s. per share on the fully paid shares, and of 5d. per share on the shares on which 8s. shall have been paid, be, and is hereby declared, payable on the 20th day of March, 1894, to the Shareholders on the Books of the Company on the 28th instant, and that the Transfer Books be closed during the said 28th instant."

By order of the Board,

I. CROCKER, Secretary.

N.B.—This Dividend will make the sum distributed out of the profits for the year 1893, 2s. 6d. per share on the fully paid shares.

#### MINING IN INDIA.

##### WHAT A LONDON EVENING THINKS OF IT.

WILL India ever waken to the fact that vast wealth is lying neglected beneath her feet? asks the "Englishman." Will she ever realise that agriculture is not the be-all and the end-all of existence; that the enormous masses of ore that lie buried beneath the soil would, if properly exploited, be at least as valuable as the crops on the surface. Gold has appealed with sufficient force to the Indian mind to induce fairly large workings for its extraction. Gold, however, is not everything in the way of ores, and far greater benefit can be derived from extracting the so-called inferior metals. No metal exists in such profusion or in such purity as iron, and iron works in India, with one exception, are practically non-existent, and yet the pity of it! Ores as fine as those of Sweden, from which some of the finest steel in the world is made, is to be found in abundance in Southern India. Authenticated records exist of this very ore being used in the manufacture of steel of a high quality, but because the first attempts, made many years ago, were not very successful, no capitalist seems inclined to venture in the matter again. Yet if pig-iron were produced in India in sufficient quantity, and of a really high quality, and if the necessary plant were established to convert this pig-iron into wrought iron and steel brands equal to the best in the home trade, there is little doubt that in a short time these brands would not only control the markets of the East, but would also be actively inquired for nearer home. India has enormous advantages in her cheap labour—advantages which we trust Parliamentary busybodies will not be able to render ineffective by interested legislation for many years to come—and in her cheap ore. These are advantages not to be easily overruled.

##### Waiting to be Picked Up.

The ores in Southern India lie on the surface, requiring merely to be picked up, cut out, in fact, like gravel. There are no costly mining works to be erected, no shafts to be sunk. Strikes are practically unknown—i.e., strikes of any importance, and the reason is not far to seek. The rate of wages ruling in India is so low that employers of labour can afford to pay good wages and yet keep their cost of production far below that of England. Every coal strike and every iron strike in England sends up the price of home-produced iron and steel by leaps and bounds. The workmen's unions at home are forcing wages up till whole trades are leaving the country—notably the London shipbuilding industry, which has been almost killed out, and the Clyde shipbuilding interest, which has suffered severely. Surely both patriotism and self-interest point to the need that India should take advantage of the present opportunity, and see that the trade which the shortsighted greed and folly of English unions is driving away from the mother country should remain under the same flag in India rather than go to foreign countries. The world will not do without iron and steel, and if the trade is driven away by strikes, or prices are forced up too far in England, works will be started in Belgium, France, and elsewhere to supply the existing demand. This demand will not slacken merely because English workmen believe that they can force higher wages by strikes. At the same time, although the demand for good qualities of iron and steel does not slacken, but on the other hand increases enormously year by year, it is strictly governed by the price. So long as the price of a certain quality of material remains within certain small limits, the manufacture of a certain number of articles can be carried on at a profit, but any considerable advance in the cost price of the material shuts out whole classes of articles from the list of those which can profitably be made, just as any considerable fall in price opens out whole trades and whole classes of goods to the material which were before closed on account of the cost. For though the consumer may be willing to pay a penny or two more for, say, his knives or scissors, or a pound or two more for his machines, yet when it comes to increases of 10, 20, and even 50 per cent. he has to limit the amount of his purchases, and to look round for a cheaper source of supply. After a while, if what he wants is not forthcoming, he has to put up with something else, possibly not quite so good, but cheaper.

##### An opening for British capital.

It does not take the manufacturer long to settle down under new conditions. His workmen get accustomed to the new methods, and though the price of the original quality may afterwards fall, the demand has ceased to exist, and cannot be revived without years of trouble, sometimes not at all, and most frequently only in part. The necessity for going without the accustomed material forces manufacturers to work their brains to discover a substitute, and as often as not they find the substitute to be as good as the original. The effect of low prices has recently been forcibly illustrated in two metals. Aluminium is the most widely distributed of all the metals, and yet it used to be looked upon as a curiosity, or, at best, used in minute quantities, as in weights for a chemical balance, where its low specific gravity made it valuable. As soon, however, as the price fell to something like twice the price of copper, aluminium began to be freely used in a thousand ways that had never been dreamt of. Not only were fancy articles, such as trays, penknives, &c., made in large quantities, but the decorative ironmonger began to use it largely, its colour and non-liability to tarnish making it a great acquisition. Should the latest American methods result, as is hoped, in the production of aluminium from the simplest and commonest ores at a price rather below that of copper, its use would be still further extended; indeed, it would very seriously affect the copper trade. Another instance which will come home to us more nearly is that of silver. Since the heavy fall in price, silver is used where it was formerly unknown. The cheapness of the metal has not only encouraged the sale of solid silver table equipage, but has forced it to a front place in the decorative art as applied to the houses of the wealthier classes in England and on the Continent. All these facts tend to keep the price of a metal down when once it has fallen. That India has an exceptional chance at present of acquiring a hold of the metal market is not to be gainsaid, and the fact cannot be made known too widely with the object of enlisting the English enterprise and capital. If the position was better understood in England, we might shortly see an entirely new development of the mineral resources of the country, and that on a scale surpassing the wildest dreams of our industrial pioneers.—*The Globe*.

Messrs. VIVIAN and SONS, Bond Court House, E.C., quote their to-day's (Friday's) prices for "Ferrobrown" metal as follows:—  
Ingots ... per lb. 5½d.  
Ordinary sheets, plates, and bars ... 6d.  
Screw bolts and nuts ... 8d.  
Pump rods, plain ... 7d.  
Do. finished ... 10d.

Castings and forgings according to specification. Discount 2½ per cent. for cash delivered. Old metal in return 2d. per lb. difference, less 8 lbs. per cwt. draft and 2½ per cent. discount.

#### THE METAL MARKETS.

##### LONDON METAL MARKET.

THE METAL MARKET—LONDON, FEBRUARY 23.

##### Copper.

AN absurd rumour was spread at the beginning of the week to the effect that some combination was being arranged amongst the English smelters with the view of giving copper a lift. The rumour no doubt served its purpose in some quarters by bringing forward some speculative orders improving the market. The improvement was only transitory, however, and consumers have not responded at all, no doubt because trade continues bad with them, and because they are too full of copper already. The continuous decline in silver makes itself much felt in connection with the trade to India, that country being unable to send any orders for yellow metal and copper squares. The G.M.B. market opened firm at £42 three months and £41 10s. 6d., and improved on speculative purchases to £42 6s. 3d. and £41 17s. 6d., respectively, the same day. On Tuesday £42 7s. 6d. was paid for three months, and £41 18s. 9d. and £42 for prompt—the 22nd, 23rd, and 26th inst. These formed the top limits of the week, and the tendency becoming quite dull again and values gradually falling back, viz., on Wednesday to £41 8s. 9d. s.c. and £41 17s. 6d. three months; on Thursday to £41 5s. and £41 13s. 9d., and to-day to £40 18s. 9d. s.c. and £41 7s. 6d. three months. The tone then improved, and £41 and £41 10s., respectively, were paid, the market closing with s.c. at £41 to £41 1s. 3d., and three months at £41 8s. 9d. to £41 10s. In furnace material a largish lot of Copiapo ore has been done at 7s. 6d., and some argentiferous Montana matte at 9s.

##### Tin.

Silver continues to recede, and tin follows in its wake. Apart from that main factor in the decline, however, tin seems to lack support on every hand, whether we look at the conditions of trade demand or speculation. Opening at £68 12s. 6d., spot Straits touched £68 7s. 6d. on Tuesday, £67 10s. on Wednesday, £66 10s. on Thursday, and £65 12s. 6d. on Friday, rallying then to £66 s.c. and £66 15s. three months, and closing in steadier tendency at £65 17s. 6d. to £66 s.c., and £66 15s. to £66 17s. 6d. three months Billiton opened at 41½ f. s.c. and 41¾ three months, and has steadily declined to 40½ and 40½ respectively.

##### Pig Iron.

The shipments from Scotland last week were 6208 tons or 2597 tons over those of the corresponding week of last year. Business in Scotch warrant took place in Glasgow on Monday at 43s. 6d. to 43s. 7½d. s.c., 43s. 8d. was attained on Tuesday. On Wednesday the value fell back again to 43s. 6d., whilst 43s. 3½d. was accepted on Thursday. To-day's business resulted in a further drop to 43s. 2½d.; and the market closed flat at 43s. 2½d. s.c., and 43s. 4½d. a month, sellers. Hematite and Cleveland close respectively at 45s. and 35s. 11d.

##### Lead.

has been a steady market throughout the week. There has been no special feature to report, but business has been done at £9 7s. 6d. and £9 6s. 3d. We closed steady at £9 7s. 6d. soft foreign, and £9 10s. English.

##### Antimony.

continues very dull, and closing value is £36 to £36 10s.

##### Spelter.

The improvement in this article has been ephemeral, as is only natural considering the accumulation of stocks, and the fact (alluded to in an earlier report) that various new works, with improved methods and plant are producing and are expected to materially reduce the cost price. The value of spelter has gone back to about the price at which it stood before last week's rise, and closes at £15 12s. 6d. ordinaries, and £15 15s. specials.

##### Quicksilver.

continues steady, and closes unchanged in price—viz., at £5 17s. 6d. firsts, and £5 16s. seconds.

The following are to-night's (February 23) prices of metals:—

	Copper.	
Tough cake and ingot	43 10 0	43 10 0
Best selected	44 0 0	44 10 0
Sheets and sheathing	51 10 0	52 0 0
Flatbottoms	54 10 0	55 0 0
Chill bars	41 1 3	41 10 0
Good merchantable, 3 months	41 1 3	41 10 0
Copper tubes	0 0 7½	
BRASS: Wire	0	0 5½
" Tubes (solid drawn)	0	0 5½
" Sheets	0	0 5½
PHOSPHOR BRONZE: Alloys II.	55 0 0	
" III. or V.	55 0 0	
" VII.	55 0 0	
" XI.	55 0 0	
" Vulcan brand Al B.C.	55 0 0	
DURO METAL	55 0 0	
BULL'S METAL	70 0 0	
FERROBROWN: Ingots	per lb.	0 0 5
" Ordinary sheets, plates, bolts and bars	0 0 5	
" Screw bolts and nuts	0 0 5	
" Pump rods, plain	0 0 5	
" finished	0 0 10%	
DELTA METAL: No. 4 (per ton)		73 10 0
" Sheets and plates (per lb.)	0 0 10%	
" Bars, round, square, flat (per lb.)	0 0 9%	
" hexagon (per lb.)	0 0 9	
ENGLISH, Ingots, f.o.b.	71 10 0	72 0 0
" refined	72 10 0	73 0 0
" Straits, spot and 3 months respectively	73 10 0	74 0 0
" Australian, spot, and three months respectively	69 0 0	68 17 6
" Banks	65 5 0	67 2 6
TIN PLATES: " Charcoal, best quality	per box	0 15 0
" ordinary	0 11 2	0 12 3
" Coke, best quality	0 11 0	0 11 3
" ordinary	0 10 0	0 10 3
These prices of tinplates are f.o.b. at Swansea, at Liverpool 6d. per box more.		
IRON:		
Pig, g.m.s., f.o.b., Clyde, spot		
" Bootch pig, No. 1 Gartherris		
" Coltness		
" Clyde		
" Govan		
Bars, Welsh, f.o.b., Wales		
Bars, Staffordshire, at works		
Sheets		
Plates		
Hoops		
Ship plates, Middlesborough		
STEEL: English spring	nominal	
" cast	16 0	

# "THE MINING JOURNAL" SHARE LIST.

**ABBREVIATIONS AND REFERENCES.**—The following are the significations of the abbreviations and references which occur in the Share List.—*Ay.*, Antimony; *A.*, Arsenic; *B.*, Blende; *Bz.*, Borax; *C.*, Copper; *D.*, Diamond; *G.*, Gold; *I.*, Iron "Cost Book" principles: *I.* in the "Head Office" column of African Mines, signifies that the address given is not that of the head office, but of a sub- or transfer office, and *t.*, following the name of African mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

\* The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time as occasion requires. Every effort is made to ensure accuracy, and almost invariably be found correct; we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

## BRITISH MINES.

Name	Closing Price, Feb. 2, 1894.	Closing Price, Feb. 16, 1894.	Par.	Latest Dividend.	Called up per Share.	Shares Issued.	Situation of Mine.	Head Office.
Atlas	—	—	£ 1 0	—	£ 12 6	12,000	Devon	Cambridge.
Blue Hills	3/-	4/-	4/-	• 2/- May '91	6 11 6	6,000	Cornwall	Cambridge.
Botallack	—	—	—	—	51 4 6	2,220	Cornwall	St. Just.
Carn Brea	12 1/2	13 1/2	13 1/2	• 2/ Dec., '93	21 5 3	6,000	Cornwall	Carn Brea.
Cook's Kitchen	3 1/2	4 1/2	4 1/2	• 28 15 4	28 15 4	4,900	Cornwall	Carn Brea.
Cumberland	—	—	1 0	5% May, '93	1 0 0	55,000	Cumberland	7. Angel-court E.C.
Cwmystwyth	—	—	1 0	—	1 0 0	5,000	Cardigan	Treuro.
Darwensthorpe	—	—	—	—	1 18 3	4,283	Cornwall	79 1/2, Gracechurch-st.
Dawson Gt Cons.	1 1/2	1 1/2	1 1/2	• 3/- Nov. '93	2 0 0	10,2	Devon	Palmerston-building
Dolton	7 1/2	7 1/2	7 1/2	• 5/- Jan. '94	9 12 5	4,7	Cornwall	Illogan.
Drakewalls CTM	59/-	70/-	70/-	—	1 0 0	100,000	Cornwall	Illogan.
East Blue Hills	—	—	—	—	1 0 0	10,5	Cumberland	Manchester.
East Grinstead	—	—	—	—	1 0 0	20,000	Devon	8. Finsbury-circus.
East Pool	10 1/2	11 1/2	11 1/2	• 5/- Oct. '93	0 9 9	6,40	Cornwall	Camborne.
Gawton	—	—	—	—	2 17 3	2,01	Devon	20, Great St. Helens.
Great Taxe	2 1/2	3 1/2	3 1/2	• 5/- Apr. '92	4 0 0	15,000	Isle of Man	25, Great St. Helens.
Green Hurst	—	—	—	—	1 0 0	32,000	Cumberland	Douglas, Isle of Man.
Halkyn	—	—	—	—	1 0 0	10,000	Flintshire	Newcastle.
Hexham	—	—	—	—	1 0 0	18,335	Devon	Chester.
Isle of Man	—	—	—	—	5 6 0	14,000	Isle of Man	8. Queen-street-place
Williford	7	8 1/2	8 1/2	• 5/- Sep. '93	5 6 3	6,000	Cornwall	Chester.
Kingdene	LR:	—	—	—	1 0 0	15,919	Cornwall	Treuro.
Lead Hills	17/8	22/8	1 1/2	• 3/- May, '93	6 0 0	20,000	Lanarkshire	8. Queen-street-place
Levant	—	—	—	—	1 0 0	2,500	Cornwall	30, Pimlico-circus.
Lowell	—	—	—	—	1 1 6 7	7,165	Wendron	Penzance.
Mines (New)	—	—	—	—	1 0 0	9,000	Denbighshire	3. Queen-street-place
Nenthead Tubs	—	—	—	—	1 0 0	48,875	Newcastle-on-Tyne	Minera, N. Wales.
New Ballewold	—	—	—	—	1 0 0	50,000	Cornwall	St. Clement's Ho., E.C.
New Conkland	—	—	—	—	10 15 3	4,800	Cornwall	Camborne.
Padarn-andres	—	—	—	—	4 3 6	7,070	Cornwall	Revent.
Phoenix United TC	5/-	7/-	7/-	• 1/- Mar. '90	6 9 9	12,000	Cornwall	Liskeard.
Prince of Wales TC	2 1/2	3/-	3/-	—	1 1 6 6	18,000	Cornwall	37, Walbrook.
Roman Gravel	—	—	—	—	—	—	Cornwall	6. Draper's-gardens.
Rushen	—	—	—	—	—	—	Cornwall	11, Queen Vic. t.t. E.C.
No. Condorion TC	5/-	10/-	10/-	• 1/- Sept. '91	1 0 0	25,131	Isle of Man	Douglas.
South Crofty TA	1 1/2	2 1/2	2 1/2	• 3/6 Apr. '93	7 12 1	6,123	Cornwall	20, Great St. Helens.
South Darren	—	—	—	—	—	—	Cornwall	7. Union-court, E.C.
South Frances	—	—	—	—	—	—	Cornwall	7. Union-court, E.C.
Tincroft	10 1/2	11 1/2	11 1/2	• 3/- Dec. '93	15 7 6	6,000	Cornwall	7. Union-court, E.C.
Westdale	—	—	—	—	1 0 0	50,000	Cornwall	Redruth.
West Frances	1 1/2	1 1/2	1 1/2	• 1/3 Oct. '90	5 0 0	50,000	Cornwall	Redruth.
West Kiddy	7 1/2	7 1/2	7 1/2	• 2/5 May, '93	15 1 5	6,144	Cornwall	Redruth.
Wheat Agar	2 1/2	2 1/2	2 1/2	• 4/- Jan. '94	0 12 0	6,000	Cornwall	Redruth.
Wheat Bassett	3	3 1/2	4	• 2/6 Aug. '88	22 0 8	6,000	Cornwall	Redruth.
Wheat Friendly	—	—	—	—	0 11 3	10,000	Cornwall	37, Walbrook, E.C.
Wheat Grenville	1 1/2	1 1/2	1 1/2	• 5/- Oct. '93	17 10 0	6,000	Cornwall	7. Union-court, E.C.
Wheat Kiddy	14/-	15/-	16/-	—	7 9 8	4,295	Cornwall	Treuro.
Wheat Metal & F.T.	7 1/2	12 1/2	15/-	• 3/- Mar. '93	0 13 9	10,784	Cornwall	79 1/2, Gracechurch-st.

## AUSTRALIAN AND NEW ZEALAND MINES.

Achilles Gt Fl.	13 1/2	15 1/2	1 0	—	1 0 0	80,307	New Zealand	3. Church Pass E.C.
Aladdin Lamp	G	1 1/2	1 1/2	1/- July '94	1 0 0	100,000	N S Wales	4-F, Throg, Avenue.
Anglo-Saxon	G	—	—	—	1 0 0	51,000	Queensland	4, Lombard-court.
Australasian	G	1 1/2	2 1/2	—	—	210,000	Queensland	5. Queen-st. place
Australasian	G	—	—	—	1 0 0	18,315	S. Australia	5 1/2, Old Jewry Chars.
Av. New Hill Con.	1/8	2 1/2	2 1/2	—	1 0 0	54,000	W. S. Wales	Winchester House.
Blue Spur & G. G.	—	—	—	—	1 0 0	75,925	New Zealand	6. St. Helens.
Bonnie Dundee G	2/3	2 1/2	3/-	—	1 0 0	120,000	Queensland	6 1/2, Gracechurch-st.
Brilliant Block	G	1	2	—	2 0 1	250,000	Queensland	Aberchurch Chambers.
Britt. Brook Hill	G	2 1/2	4	4/5	5 0 0	240,000	N. S. Wales	Aberchurch Chambers.
Broker Hill Prop.	2 1/2	2 1/2	2 1/2	—	1 0 0	880,000	Queensland	6. Draper's-gardens.
Carrington	G	2/3	2 1/2	—	1 0 0	18,000	Queensland	12 1/2, Gracechurch-st.
Coromanda	G	—	—	—	1 0 0	100,000	Queensland	13, Queen-st. pl.
Craven's Cal.	3 1/2	4 1/2	4 1/2	—	1 0 0	100,000	Queensland	20 1/2, Queen-st. pl.
Croydon King Elk	—	—	—	—	1 0 0	4,500	Queensland	21, Old Jewry Chars.
Cumberlind (New) G	—	—	—	—	1 0 0	120,000	Queensland	25, Old Broad-st.
Day Dawn B.W.G.	4 1/2	5 1/2	5 1/2	—	1 0 0	494,400	Queensland	26, Old Broad-st.
Day Dawn P. C. G.	5/6	5/6	5/6	—	1 0 0	490,000	Queensland	27, Old Broad-st.
Eaglehawk	G	1/2	1/2	1/6	1 0 0	120,000	Queensland	28, Old Broad-st.
Etheridge	G	—	—	—	1 0 0	120,000	Queensland	29, Old Broad-st.
Golden Gate	G	—	—	—	1 0 0	150,000	Queensland	30, Old Broad-st.
Glenrock	—	—	—	—	1 0 0	225,000	Queensland	31, Old Broad-st.
Harrietville	G	—	—	—	1 0 0	146,330	Victoria	32, Queen-st. E.C.
Kabonga	G	—	—	—	1 0 0	200,000	Queensland	32, Queen-st. E.C.
Kangarilla	G	—	—	—	1 0 0	88,275	Victoria	33, Queen-st. E.C.
Kapanga	G	—	—	—	1 0 0	250,000	Victoria	34, Queen-st. E.C.
Kilkivan	—	—	—	—	1 0 0	120,000	Victoria	35, Queen-st. E.C.
Widias G. P.	G	—	—	—	1 0 0	180,000	Victoria	36, Queen-st. E.C.
Mills' Day Dawn G	15 1/2	16 1/2	16 1/2	—	1 0 0	250,000	Victoria	37, Queen-st. E.C.
Moruya	G	—	—	—	1 0 0	150,000	Victoria	38, Queen-st. E.C.
Mosman	G	4 1/2	5 1/2	—	1 0 0	185,000	Victoria	39, Queen-st. E.C.
Mt. Leyshon	G	1/2	1/2	1/2	—	50,000	Victoria	40, Queen-st. E.C.
Mountain Maid C	1/8	2 1/2	2 1/2	—	1 0 0	175,989	Queensland	41, Queen-st. E.C.
Mt. Morgan Ex. G	11 1/2	2 1/2	2 1/2	—	1 0 0	180,000	Queensland	42, Queen-st. E.C.
Mt. Shamrock GB	—	—	—	—	1 0 0	275,000	Queensland	43, Queen-st. E.C.
Mount Zeehan	—	—	—	—	1 0 0	193,257	Tasmania	44, Queen-st. E.C.</td

## "THE MINING JOURNAL" SHARE LIST (African Mines continued).

Name.	Closing Price, Feb. 22, 1894.	Closing Price, Feb. 16, 1894.	Par.	Latest Dividend.	Called up Per Share.	Shares Issued.	Situation of Mine.	Head Office.	Name.	Closing Price, Feb. 23, 1894.	Closing Price, Feb. 16, 1894.	Par.	Latest Dividend.	Called up Per Share.	Shares Issued.	Situation of Mine.	Head Office.
Joe's Luck	G 2/- 3/-	2/8	1 0	—	2 s. d.	57,404	De Kaap .....	11, Queen Vic.-st.	Piggs Peak .....	G -/3 -/9	-/9	1 0	—	1 0 0	230,326	Swaziland .....	6, Queen-street-place
Jubilee	G 51½ 6½	6½ xd	1 0	30% Oct. '93	1 0	30,000	Witwatersrdt.	8, Old Jewry, I.	Potchefstroom .....	G 2/- 2/8	1 0	—	1 0 0	161,000	Potchefstroom	19, Bury-st., E.C.	
Jumpers	G 31½ 3%	3½ xd	1 0	10% Jan. '93	1 0	100,000	Witwatersrdt.	29, Holborn Viaduct, II	Princess Estate	G 15/- 17/6	17/6	1 0	—	1 0 0	72,046	Witwatersrdt.	33, Cornhill, E.C.
Kleinfontein	G 6/- 6/6	6/6	1 0	—	1 0 0	150,000	Witwatersrdt.	8, Old Jewry.	Randfontein .....	G 12/- 13/-	11/-	1 0	—	1 0 0	1,966,500	Witwatersrdt.	59, Holborn Viaduct, I
Klerksdorp	G —	—	1 0	—	1 0 0	250,000	Witwatersrdt.	110, Cannon-street.	Read's Drift .....	D 9/- 10/-	—	—	—	—	50,000	Transvaal .....	19, Finsbury circus,
Knight	G 15/- 17/6	16/6	1 0	—	1 0 0	467,000	Witwatersrdt.	19, Bury-street, E.C.	Robinson .....	G 4½ 5	41½	5 0	4% June '93	5 0 0	542,750	Transvaal .....	59, Holborn Viaduct, II
Langlaagte Est.	G 39½ 31½	3% 3 0	20% July, '92	1 0	1 0 0	283,233	Lydenburg .....	59, Holborn Viaduct, I	Roodepoort Un.	G 1 0	—	—	—	—	100,000	Witwatersrdt.	30-1, St. Swithin's-in-Warnford-court, I
Lisbon-Blynn	G 2½ 3/3	3 1½ 2 6	1 0	—	1 0 0	110,000	Witwatersrdt.	110, Cannon-street.	St. Augustine .....	D -/4½	-/4½	1 0	—	1 0 0	465,000	Witwatersrdt.	1, Grosby-square, I
Lulpards Vlei Est.	G 10/- 12/6	9/9	1 0	6% Mar. '90	1 0 0	344,003	Witwatersrdt.	8, Old Jewry.	Salisbury New .....	G 2½ 2½	2½	1 0	-/8 Aug. '93	1 0 0	614,450	Lydenburg .....	18, St. Helen's-place,
Main Reef	G 5/6 5/9	5/3 xd	1 0	—	1 0 0	300,000	Witwatersrdt.	Warnford-court, I	Sheba .....	G 21/- 22/-	23/6	1 0	—	1 0 0	85,000	Witwatersrdt.	4, Sun Court, E.C.
Manica Ophir	—	—	—	—	1 0 0	96,000	Witwatersrdt.	2, Pinzer's Court,	Siliati .....	G 2/9 3/3	4/	1 0	—	1 0 0	93,000	Witwatersrdt.	33, Cornhill,
May Consol.	G 10/- 10/8	10/6	1 0	—	1 0 0	430,000	Witwatersrdt.	4, Lothbury, I.	Simmer & Jack .....	G 4½ 4½	4½	1 0	10% Nov. '93	1 0 0	220,000	South Africa .....	8, Old Jewry.
May Deep Level	G 9/- 9/	7/6	1 0	—	1 0 0	146,000	Witwatersrdt.	1, Crosby Square, I	S.A. Gold Trust .....	G 17/- 18/-	19/-	1 0	10% April '93	1 0 0	144,531	Lydenburg .....	18, Bishopsgate-st, Wt.
Metropolitan	G 13/9 18/3	16/3	1 0	35% July '93	1 0 0	71,637	Witwatersrdt.	Warnford-court, I	Spitzkop .....	G 1/6 2/	2/3	1 0	50% May '93	1 0 0	34,000	Witwatersrdt.	1, Crosby Square, I
Meyer & Charl.	G 5½ 5½	5½	1 0	—	1 0 0	45,000	Witwatersrdt.	2, Stanhope .....	St. Swithin R. ....	G 1 ½ 1½	—	1 0	—	1 0 0	220,000	Zoutpansberg .....	2, Old Broad-st, E.O.
Mitchell	G 6/6 7/-	7/6	1 0	—	1 0 0	200,000	Witwatersrdt.	2, Teuton .....	Teuton .....	G —	—	1 0	—	1 0 0	96,000	Witwatersrdt.	3, Budge-row, E.C.
Modderfontein	G 6/6 7/-	7/6	1 0	—	1 0 0	240,000	Witwatersrdt.	3, Old Jewry, I.	Trans. Coal Trust .....	G 11/6 12/-	12/-	1 0	-/6 Oct. '93	1 0 0	438,965	Witwatersrdt.	1, Grosby-square, I
Moodies G. & E.	G 9/8 10/8	10/-	1 0	-/4 May '90	1 0 0	120,000	Witwatersrdt.	4, Old Jewry .....	Trans. Est. & Dev. ....	G 10/6 11/5	12/5	1 0	—	1 0 0	285,700	Transvaal .....	2, Old Broad-st, E.O.
Moodies (15-p.) G	G 4/6 5/6	5/6	1 0	—	1 0 0	—	Witwatersrdt.	5, Old Jewry .....	Trans. Gold .....	G —	—	1 0	1/ Dec. '93	1 0 0	250,000	Suffolk House, E.O.	3, Old Jewry.
Paarl Central	G 12½ 13	13	1 0	—	1 0 0	150,000	Witwatersrdt.	34, Lesdenhal-blids .....	Trans. Land (14/3p) .....	G 3/4 4/	4/	1 0	—	1 0 0	250,000	Transvaal .....	33, Cornhill,
Namaqua	G 15/- 20/-	20/-	2 0	2/3 July '91	2 0 0	191,351	Witwatersrdt.	3, Old Jewry, E.C.	Un. Ivy Reef .....	G 20/- 22/6	22/6	1 0	—	1 0 0	45,000	Transvaal .....	110, Cannon-street.
New Chimes	G 1½ 1½	1½	1 0	—	1 0 0	70,000	Witwatersrdt.	4, Hishopsgate-st, Wt.	Un. Lunglaagte .....	G 12/8 15/-	15/-	1 0	—	1 0 0	103,000	Witwatersrdt.	23, St. Swithin's-in-Portland House, E.O.
New Crossus	G 1½ 1½	1½	1 0	5% Aug. '92	1 0 0	195,000	Witwatersrdt.	5, Coothall-buildings .....	Van Ryn .....	G 7/8 10/-	11/3	1 0	—	1 0 0	98,810	Witwatersrdt.	1, Crosby-square, I
New Jaggers	G 14½ 14½	14½	10	—	10	100,000	Witwatersrdt.	2, Draper's-gardens .....	Victory Hill .....	G —	—	1 0	—	1 0 0	106,000	Witwatersrdt.	2, Old Jewry.
New Primrose	G 31½ 31½	4½ 3½	1 0	4/- July, '93	1 0 0	230,000	Witwatersrdt.	1, Crosby-square .....	Village Main Reef .....	G 4½ 4½	4½	1 0	—	1 0 0	132,000	Witwatersrdt.	28, Budge-row, E.C.
Nigel	G 2½ 2½	2½	1 0	10% Dec. '93	1 0 0	160,000	Witwatersrdt.	2, Old Jewry .....	Virginia .....	G —	—	1 0	—	1 0 0	49,355	Witwatersrdt.	34, Leadenhall-blids, I.
Hooftgedacht	G —	—	1 0	—	1 0 0	150,000	Witwatersrdt.	3, Sun Court, E.C.	Vogelstruis .....	G —	—	1 0	—	1 0 0	157,000	Witwatersrdt.	19, Bury-street, I.
Oceans	G 21½ 21½	21½	1 0	25/- Nov. '93	1 0 0	150,000	Witwatersrdt.	31, Lombard-street .....	Wemmer .....	G 4½ 4½	4½	1 0	10% Nov. '93	1 0 0	55,000	Witwatersrdt.	29, Old Broad-st, E.O.
Ophir Concess.	G 7/9 1/3	1/3	1 0	—	1 0 0	111,857	Witwatersrdt.	31, Moorgate-street .....	Orange F. State .....	G —	—	1 0	—	1 0 0	250,000	Witwatersrdt.	19, Bury-st., E.C.
Orange F.S.E.	G 3½ 4	4½	1 0	—	1 0 0	284,000	Witwatersrdt.	10, Moorgate-street .....	Wolhuter .....	G 2½ 2½	2½	1 0	—	1 0 0	120,000	Witwatersrdt.	29, Old Broad-st, E.O.
Oriental	G 1½ 2/	2/	1 0	—	1 0 0	446,450	Witwatersrdt.	113, Cannon-st., E.C.	Worcester .....	G 1½ 2	2	1 0	—	1 0 0	90,727	Witwatersrdt.	8, Old Jewry, I.
Otto's Kopje	G 1/- 1/6	1/6	1 0	—	1 0 0	500,000	Witwatersrdt.	29-30, Hol. Via., E.C.	Zwartland Land .....	G —	—	1 0	—	1 0 0	150,000	Transvaal .....	19, Bircham-lane, E.C.

## COMMERCIAL MINING.

By Mr. F. DANVERS POWER, F.G.S. MAIME.

## III.

(Concluded from page 172).

ONE man I know in Melbourne makes a point of owning the largest share in any mining venture he goes into, so that he can have the controlling voice in its future. By this means he has an interest which is worth his while to look after, and he can command the money of his fellow shareholders to carry out his plans. Most of the mines are managed in his office, and should one fail and go into liquidation, he sells the machinery to one of the more successful mines, whether it wants it or not, as long as it suits his plans, which it generally does, for he mostly has a mortgage over the defunct property.

As to the constitution of a company, that also frequently determines its success or otherwise. If a limited liability, the property is at least sure of a fair trial, provided the capital subscribed is sufficient and is used for the working of the mine; but if a company is registered under the no liability Act, like most of the Australian mines, it is convenient for a shareholder who wishes to back out by forfeiting his shares, should he not be satisfied with his prospects; but the difficulty of securing calls greatly retards the development of a non-dividend paying concern and tempts the legal manager so to manipulate the mine manager's weekly reports, as to give them a false colour. Many an unhappy mine manager, surprised at seeing a report supposed to proceed from him, writes to town to demand an explanation, in reply to which he is informed that his report was too long to print *in extenso* so it had to be curtailed; that it was written in such bad English the legal manager was obliged to put it into readable form; that the use of technical expressions made it necessary to simplify the report for the public use; or in some cases, instead of trying to cover their actions by excuses, the mine manager is told straight out that it would be impossible to get calls in with such a report as he wrote, and that many more like that would close the mine and throw him out of employment.

A mine is like a child, it must have money spent on its development before it can be expected to pay its way, unless it is a monstrosity. There are many mines, which, if opened up properly to commence with, would pay well, but as they are worked on a small scale, and exist on a hand-to-mouth principle, they cannot make ends meet. It is generally cheaper to work on a large than a small scale; the expenses of management is distributed over a larger number of men; miners, instead of being suspended when work is slack at one part of the property, which breeds discontent, can be employed on another portion, and so, instead of creating dissatisfaction among the employees, you gradually collect and retain the best skilled labour in the country, which always comes where constant employment is certain; in short, on a large property, the different departments can play into each other's hands, and it will pay them to do things for themselves that a small mine would not be warranted in doing, owing to the expense of the first outlay in a plant that could not be fully utilised.

There are, of course, many properties that nature never intended should be converted into mines, but in spite of which man insists on working, in the hopes of extracting valuable metals, if not from the rock, at least from the shareholders' pockets. Again, there are other properties, which, although they cannot pay at present, owing to adverse local conditions or the want of improved processes, will yet pay at a later date when these difficulties are overcome. But there are other mines that ought to pay now, if properly worked, which on account of the bad way in which they have been financed bring no profit, except to the first robbers. Under this category are those mineral properties that have proved failures when under capitalized, but which when reconstructed on a more liberal scale have been successful; in the meanwhile much money has been thrown away, and the original shareholders require a large profit to make up their losses. The number of shares in a company, their value, whether they are fully or partly paid up, whether ordinary or preferential, and whether they have all been subscribed for, are all important features in the success of mining from a monetary point of view. It may be easier at times to float a mine in £1 shares than if valued at, say, £100; they both have their *pro et con*. A low-priced share enables it to circulate among a class of people whose presence is not always desirable; they may take a fancy to operate on the shares, and to pull or bear them in such a manner as to finally ruin the reputation of the mine; this is not so readily done in more expensive parcels. The mine manager can at times checkmate such persons, or at least can make it more difficult for them to practice their nefarious plans. If his mine is properly opened up, he can equalise the value of his output by treating rich ores when circumstances prevent him from working large quantities, such as want of water or fuel; he thus diminishes the excuse for sending shares up or down in the market with every fluctuation of the weather.

If vendors are partly recouped in paid up shares, they should not be allowed to flood the market with them to the hurt of those shareholders who have paid hard cash for their interests.

Sometimes, in order to entice the public to take up shares, the vendors guarantee a certain interest for so many years; this interest, when not forthcoming from the property, is sometimes paid out of the cash received for the mine, or from the sale of shares received in part payment; in other cases they "bear" the shares down to such a pitch that they are enabled to purchase the majority of the shares at a less price than they guaranteed for interest, and then close the mine. The fact of a mine having paid dividends is no proof that it is a desirable one to invest in; the dividends may have been procured by the sale of "pups," or even direct from the capital in the hopes of drawing fresh blood into the concern; or dividends may be paid out of money fairly earned, which it would have been better to place in a reserve fund, so as to avoid the necessity of a call for, say, increasing the plant; in such a case the dividend is virtually paid out of the call. Other causes which result in disappointment to mining investors might be mentioned, such as the excessive prices often given for properties, mere prospects, on which interest can only be expected in years to come, if ever. Miscalculations as to expenses of working are rife, the cost of stopping frequently being taken as

result of crushing for past fortnight:—"250 tons, yielding 530 ounces gold. No. 4 formation, 155 tons, yielding 192 ounces gold. Will ship 1140 ounces *Roma*.

**ORION GOLD.**—The profit for December was £2004.

**OUCO PRETO.**—This company has received a cablegram from the mines giving the return for the month of January as follows:—"3117 tons produced 31,373 grammes=1009 ounces."

**PAHANG CORPORATION.**—The output of black tin from the mines during the month of October, weighing wet piculs 296.68 (174 tons) has been sold in Singapore, realising \$6786.58. Up to date of last mail advises the tin produced in November and December has not been sent down to Singapore for sale owing to the prevalence of the north-east monsoon.

**VICTORIA GOLD MINING ASSOCIATION.**—A dividend of 6d. per share has been declared, payable on the 14th March.

**WAHI GOLD.**—Bullion return for the 38 days ending 10th February, £6500 from 2300 tons.

### SOUTH WALES IRON AND COAL TRADE REPORT.

CARDIFF, Friday Evening.

Coal market this week has been fairly active but there is room for improvement, supply being still in excess of the demand and prices have consequently a downward tendency. Current quotations are:—Best steam coal, 13s. to 13s. 6d.; seconds, 12s. 6d. to 12s. 9d.; inferior sorts from 10s. 6d. to 11s. 3d.; small, 6s. 6d. to 7s. per ton; best house coal, 11s. to 11s. 6d.; No. 3 Rhondda, 12s. 9d.; small, 8s.; and patent fuel 12s. 3d. to 12s. 6d. per ton. Coke is in improved demand, foundry ranges from 18s. to 19s.; and furnace 16s. to 17s. per ton. Pit props are offered at 14s. 9d. per ton. Iron ore prices are a shade weaker, best Rubio realises 11s. 9d., and Tafna and Garrucha 11s. per ton. There is a good demand for pig iron, but finished iron and steel trade lacks animation owing to the diminished output. Market for tin plates has hardened and makers are hopeful that an advance will shortly be obtained.

### REPORTS FROM THE MINES.

We find it necessary to announce that, owing to the vast numbers of mining reports, and items of mining intelligence which reach us invariably very late—up to, and frequently after the time of going to press—it is impossible to guarantee the insertion of all of them in the issue in which, in ordinary course they should appear. We always endeavour, however, to make this important feature as complete as possible, and if the secretaries of mining companies, mining captains, and others would kindly make an effort to let us have their reports, etc., reach us early on Fridays, when it is not possible to let them earlier in the week, their doing so would go far to ensure their insertion, and to promote the completeness of our Mining Intelligence.

#### BRITISH MINES.

**CARN BREA**—February 16: H B West: The shaft is sunk 4 fathoms below the 325 fathom level. In driving the 310 fathom level west of shaft we have not yet reached the south side of the elvan, where we expect to meet with the lode we are sinking on below the 298 west. The lode in the winze sinking below the 298 west is worth £35 per fathom; this winze is in advance of the 310 end 5 fathoms. The lode in the rise in back of the 298 fathom level west is worth £20 per fathom; rise up 11 fathoms.—H B East: We have completed the cutting of the trip plat at the 310 fathom level and have also fixed tramways in this level both east and west of shaft, and are now discharging stuff therefrom. The shaftmen are now fixing the lift for forking below this level. The lode in the winze sinking below the 286 fathom level east is worth £12 per fathom; winze down about 10 fathoms. The lode in the 170 end west of north cross cut is worth £9 per fathom; in the rise in back of this level £10 per fathom.—Old Sump: The engine shaft is being sunk below the 256 fathom level by a full pare of men. Cross cut south of shaft at the 256 fathom level to cut Druid north lode is driven 14 feet. Druid north lode in the 244 end east is worth £8 per fathom. The lode in the rise in back of this level is worth £10 per fathom. The building of the new air compressor house is in a forward state and will be ready for fixing the roof in about a weekly time.—(Signed) W. T. White and Agents.—P.S.: We have to-day cut through the elvan in the 310 end west of H B West shaft, and find a branch 6 inches wide producing good stones of tin and underlying south 2 feet in a fathom.

**DRAKEWALLS.**—J. Hosking and T. Chapman, February 22, 1894: The crosscut through the lode at the 160 fathoms level east of the engine shaft is still in hard capet. The mundic stopes in the back of the 160 and bottom of the 147 fathoms levels east of the engine shaft are producing fair work. One stope for tin and arsenic in the back of the 160 west of engine shaft is producing ore of moderate quality. The principal stopes for tin in the back of the 173 fathom level have not been worked during the week in consequence of the water being in that level. The surface water coming in at the 80 and 90 fathoms levels is fast decreasing, and having stopped the pumping-engine twenty hours to repair main rod we now expect to be in fork to the bottom of the mine within a week.

**DEVON GREAT CONSOLS.**—William Clemo, February 22: Wheal Anna Maria engine shaft: In the stope in the bottom of the 110 fathom level east the lode is yielding 9 tons of mundic ore per fathom.—Field shaft south lode: In the stope in back of 130 west the lode is yielding 2 tons copper ore and 10 tons mundic per fathom.—Wheal Josiah, Richard's shaft: The stope in the bottom of the 103 east is worth 8 tons mundic per fathom.—Agnes' shaft: The stope in the bottom of the 103 west is producing 4 tons copper and mundic ores per fathom. In the stope in the back of the 90 west the lode is worth 3 tons copper and mundic ores per fathom.—Wheal Emma, Thomas' shaft: In the stope in the bottom of the 100 east the lode is producing 9 tons of mundic ore per fathom. In the stope in bottom of 100 east there is a good lode yielding 2 tons of copper ore and 16 tons mundic per fathom. In the stope in the back of the 100 east there is also a good lode worth 2 tons copper ore and 13 tons mundic per fathom.—Inclined shaft: The stope in the back of the 150 east is yielding 2 tons of copper ore and 7 tons mundic per fathom. In the stope in the back of the 150 east the lode is worth 2 tons copper ore and 6 tons mundic per fathom. The stope in the back of the 112 west is worth 2 tons copper ore and 2 tons mundic per fathom. Stope in back of 100 west is worth 1 ton copper ore and 4 tons mundic per fathom.—New shaft, new south lode: The stope in bottom of 190 east is producing 7 tons mundic per fathom. The stope in back of 130 east is yielding 2 tons copper ore, and 4 tons mundic per fathom.—Watson's engine shaft: In the 172 east the lode is 3 feet wide composed of capel, quartz, and little copper and mundic ores. In the 160 east the lode is 4 feet wide yielding 3 tons copper and mundic ores. In the 148 east the lode at present is not so productive as it has been for some time past it is however yielding 5 tons mundic and copper ores per fathom. In stope back of 172 east the lode is yielding 6 tons copper and mundic ores per fathom. Stope in bottom of 148 east is also worth 6 tons copper and mundic ores per fathom. In stope back of 148 east lode is producing 5 tons copper and mundic ores per fathom. Stope in back of 136 west is also yielding 5 tons copper ores and mundic per fathom. The weather continues favourable and workings underground and at surface are in full operation.

**LEADHILLS.**—G. Menzies, February 19:—Brown's Vein: More progress these two or three days with the getting out of the Jeffrey's shaft water. The 160 fathom level north of Wilson's shaft is in vein above 4 feet wide showing stone too hard and dried for yielding ore. The stope above the 145 north of Jeffrey's shaft is worth 25 cwt. of ore per fathom. The stope above the 130 north of

Jeffrey's shaft is worth 20 cwt. of ore per fathom. The 115 fathom level north of Jeffrey's shaft is in a vein above 4 feet wide showing a fine rib of spar, but without ore. Nos. 1, 3, and 4 stopes above the 115 north of Jeffrey's shaft are worth 30, 20, and 40 cwt. of ore per fathom respectively. Cleaning out No. 2 stope. The 115 fathom level south of Wilson's shaft is in a vein above 4 feet wide mainly stone too soft and dried for producing ore. The sinking below the 100 north of Jeffrey's shaft is worth 30 cwt. of ore per fathom. The 100 fathom level south of Wilson's shaft is in a vein above 4 feet wide composed of nice looking spar with spots of ore not to value. The 85 fathom level south of Wilson's shaft is in a vein above 4 feet wide, mostly stone with a mixture of spar too dried for yielding ore. The winze below the 85 south of Wilson's shaft is in a vein above 4 feet wide, charged with kindly spar and ore worth 50 cwt. per fathom. The stope above the 85 south of Wilson's shaft is worth 60 cwt. of ore per fathom. No. 2 winze below the 70 south of Wilson's shaft is in a vein above 4 feet wide, charged with improving spar and spots of ore not to value. The drift above the 50 south of winze is worth 40 cwt. of ore per fathom. The stope below the 35 south of Flat Rod shaft is worth 20 cwt. of ore per fathom. The stope above the 35 south of Flat Rod shaft is worth 35 cwt. of ore per fathom.—Sarrowcole vein: Gripp's adit north of George's Rous vein is in a vein above 4 feet wide, almost exclusively stone of too hard a nature for producing ore. Gripp's adit south of George's Rous vein is in a vein nearly checked at present, the quartz and spar being only some 6 inches wide.

**SOUTH FRANCES UNITED.**—February 20: Setting report: The 285 fathom level to drive west of Pascoe's by six men and three boys with a boring machine at £7 per fathom. Lode worth £12 per fathom. A stope in back of the 285 east is worth £10 per fathom. Stopping by six men at 4s. per ton. The 246 fathom level to drive west by six men and three boys with a boring machine at £7 10s. per fathom. This end has further improved and is now worth £20 per fathom. A winze below this level by 12 men at £13 per fathom. Lode worth £14 per fathom. Stope in back of this level is worth £13 per fathom. Stopping by 14 men at 4s. per ton. Stope in back of the 144 west of Grenville's is worth £10 per fathom. Stopping by six men at 3s. 9d. per ton. Stope in back of the 134 west of Grenville's is worth £12 per fathom. Stopping by 14 men at 5s. per ton. The 124 fathom level to drive west of Grenville's by four men at £10 10s. per fathom. Lode worth £11 per fathom. Rise in back of this level by four men at £8 per fathom. Lode worth £10 per fathom. Stope in back of this level is worth £12 per fathom. Stopping by eight men at 3s. per ton. At Daubuz's we completed the skip road from surface and newly fixed shaft tackle and brace for drawing purposes, also fixed new plunger lift at the 100 level and put down nearly 50 fathoms of new main rods. We have commenced to sink the shaft with a pare of 18 men, the sinking of which we shall force on with all possible speed. In our tribute department we have 62 pitches working by 160 men on tributes varying from 6s. 8d. to 12s. 6d. in the £, the standard for tin being £23 per ton.—William Hooper, John Opie, Richard Williams, William H. Richards.

**SOUTH CONDURROW.**—February 21: The flat lode in the 153 end west has an improved appearance, and is yielding good stones of tin. More water than usual is coming from the lode in the bottom of the level. The engine lode in the bottom of the shaft is about 2 feet wide, regular and well-defined, and carries low quality flintstone. The engine lode in the 153 end west is not so easy for working as it has been. The ground continues favourable for driving in the 153 crosscut south. (Signed) William Rich, William Thomas, Fred Rich.

**TINCROFT.**—We have commenced to drive east at the 330 fathom level in Martin's east shaft preparatory to cutting the plot. In the 320 fathom level driving east of Martin's east shaft the lode is worth for tin £10 per fathom. In the winze sinking below the 320 fathom level west of Martin's east shaft the lode is worth for tin £15 per fathom. In the 306 fathom level west of cross cut and east of Martin's east shaft the lode is worth for tin £10 per fathom. In the winze sinking below the 320 fathom level east of Harvey's engine shaft the lode is worth for tin £11 per fathom. In Downright shaft we have brought down the skip road to the 320 fathom level, and commenced to draw from that level to day. Everything is working very satisfactorily. In the 320 fathom level west of Downright shaft the lode is producing saving work for tin. In the 212 fathom level driving west of Downright shaft on Chapple's lode we are very pleased to report an important discovery. We have driven about 12 fathoms in a very productive lode, which is worth to day £20 per fathom.—North Tincroft: In Willoughby's shaft sinking below the 154 fathom level the lode is worth for tin £10 per fathom. In the 154 fathom level driving west of No. 3 winze, east of Willoughby's shaft, the lode has a very splendid appearance, being highly mineralised throughout, and worth for tin and arsenic £30 per fathom. No. 2 winze is sunk to the 164 fathom level in a very productive lode. In No. 1 winze sinking below the 154 fathom level the lode is worth for tin and arsenic £12 per fathom. In the 120 fathom level driving east of Willoughby's the lode is worth for tin and arsenic £11 per fathom.—(Signed) Wm. Teague, John Hammill, Geo. Nancarrow.

**WEARDALE LEAD.**—Report on Weardale Company's mines for week ending February 17: Groverake: Slate sill drift west sparry vein mixed with stone, poor in ore, and slow to drive, worth 10 cwt. per fathom. Adamsons drift west, a quick string is coming in from the north, end worth 14 cwt. per fathom. Rise from Rowell's old ground to 30 fathom level is now holed, but not yet made good. 60 fathom level east, in cross cutting south there is great strength of spar, but very poor looking. Groverake cubic fathom stopes worth 10, 12, 16, 18, 12, 12, 14, 16, 14, 12 and 12 cwt. per fathom.—Bolts burn: Cross cutting south from Watts level searching for flats, forehead bad appearance, and this cross cut stopped and another started from Watts level. Forster's cross cut north, indications of flats, a little spar and some ore, but none to save. Stopes worth 20, 30, 34, 28, 38, 20 and 32 cwt. per fathom.—Greenlaws: Watson's drift, drifting in plate under 6 fathoms hazel, vein nipped. Nattrass Gill drift, stopes worth 12, 20, 14, 14, 12, 24, 20, 20, 26 cwt. per fathom. Lowe's drift, vein improving, more fluor spar. Lee's sump strong sparry vein worth 20 cwt. per fathom. Stopes in Killhope Mine worth 18, 14, 16, 12, 12, 14, 16 and 14 cwt. per fathom.—Craig's level Grovehead Flatts, worth 16 cwt. per fathom.—Sedling: The 56 level is now opened up 96 fathoms east from drawing shaft, level crushed full. Bottom of shaft crosscutting north in scarp lime, 6½ fathoms has been driven, end composed of hard rider, quartz, spar, some fluor, and a little ore. The beds are dipping, but vein not yet cut. 64 fathoms level has been driven 25 3-6 fathoms, end worth 14 cwt. per fathom. Stopes worth 14, 12, 14, 18, 14, 16, and 12 cwt. per fathom. South vein Stubb's drift vein worth 12 cwt. per fathom. Ore raised for week, 96 tons; ore dressed for week, 76 tons; ore and slag smelted for week 133 tons, producing 70 tons of pig lead.

**WHEAL METAL AND FLOW.**—February 21: We have passed through the cross course in the intermediate level, which is about 2 feet wide. The lode the other side of it is at present disordered, but the killas is of a promising nature for the production of mineral. No other change to report.—(Signed) Stephen P. Curtis.

#### COLONIAL, INDIAN, AND FOREIGN MINES.

**NEW QUEEN.**—The following fortnightly report has been received from the mine, dated Charters Towers, January 5:—No. 4 South Level: Stopping has been carried on, the reef has been somewhat irregular and a considerable portion of blank ground is in this stope at present, the reef varies from 3 inches to a foot. No. 5 south level has been extended a further distance of 10 feet making 131 feet from underlie shaft; the reef in the end of level is split and there is a vein about 3 inches thick on each wall; the reef in the stope varies from 3 to 10 inches, the ground is hard. No. 5 north level has been extended a further distance of 12 feet making 72 feet from underlie shaft. The formation is very small being about 18 inches wide with a vein of quartz about 3 inches in the end of level. Very little stopping is being done over this level the reef being very

small. Underlie Shaft: Advantage has been taken of the holidays to sink a well hole from the bottom of the No. 5 level, a distance of 12 feet being sunk with a little rubby quartz in face. No. 4 formation, the leading stope has been carried back to about 40 feet from the crosscut. A leader of stone on footwall about 4 inches appears in the stope. A large haulage of mullock has come from this stope; the necessary stull timber is in position, and, I hope, by the end of next week to be able to put the air pipes up to the level face. Repairs: The necessary repairs were done during the holidays and I am pleased to report everything in good order. Quantity of stuff raised during the fortnight, quartz 220 tracks, mullock 875 tracks, total 1095 tracks.—(Signed) W. Henderson.

**PESTARENA.**—Mid-monthly report: Ends: The 70 end east is at present in a disturbed state, the quartz lode having almost completely cut out the No. 1 lode. The former is now 180 metres wide, and carries 25 centimetres of quartz and pyrites on the footwall, and also a wedge shaped piece of ore 40 centimetres in the roof, reaching to the middle of the end. Its value is now estimated at 4 tons of 1 ounce per fathom. The 70 west on No. 1 lode still maintains its size and value, producing 9 tons of 2 ounce ore per fathom. The branch of ore on the A and B lodes is better defined than formerly, and is at present valued at 2½ tons of 1 ounce 5 dwts. per fathom. The lode in the 55 east is now 80 centimetres wide, carry branches of pyrites on each wall, and the intervening rock being also slightly charged with pyrites. The walls are well defined, and altogether its appearance seems to be more promising, its value is now estimated at 6 tons of 1 ounce 5 dwts. per fathom. Crosscuts, nothing of importance has been met with in either of these since last reported. Stopes, these continue to produce about the same quality and quantity as was reported on the 3rd inst. Machinery, the weather has again set in much colder and great difficulty is being experienced in keeping the pumping and other machinery going. It is hoped, however, that a change for the better will soon occur as it is unusual for such severe weather to last much after the middle of February. Under existing circumstances fair progress is being made with forking the water to 130 fathom level, it being now about 4 metres over the roof. Transport of timber, this is being prosecuted with the utmost vigour, being continued day and night to profit by the favourable state of the weather. Stabilo mine, no change worthy of notice has occurred during the past fortnight.—(Signed) W. Henwood Trelease, T. Henry Messa.

**TOLIMA.**—The directors have received advices by the mail of the 21st of February, 1894, from their mines, of which the following is an abstract:—Friar December returns 220 tons (estimated), silver estimated at 31d. per ounce, £10,614 16s. 6d.; silver estimated cost, £5471 9s.; silver estimated returns, £5143 7s. 6d. The underground agent reports 98 fathoms 5 feet 7 inches of ground expended, of which 63 fathoms 2 feet 2 inches were productive, leaving of unproductive ground 35 fathoms 3 feet 5 inches. The superintendent, writing 18 days after the date of the underground report, says—The most interesting feature of this month's (December) report is the satisfactory development of the 90 fathom east end, which continued during the month with an average yield of 1½ ton per fathom of high grade mineral. During the current month (January) I have to report a still further improvement, the yield during the past ten days having averaged 2½ tons per fathom, which (silver being taken at 64c.) I estimate to be worth £100 per fathom. He adds the 110 fathom east end continues steadily to improve, and continues, the lode in the 130 west end continues strong and healthy, yielding spots of mineral. From present appearances we have good prospects ahead. Underground report, engine shaft: During the month we changed a piece of main rod at the 40 fathom level, and also one just above the adit level. The footwall of the shaft is cut down to 34 feet below the sole of the 100 fathom level, and also the shaft is cut to required dimensions to 28 feet below the 120 fathom level. 130 fathom west end was driven 14·6 feet by four men at 870 per fathom, being 215·7 feet as total west of winze. The lode has continued strong and of healthy appearance, yielding here and there some good stones of mineral. 130 fathom east end was driven 10·1 feet by two men at \$65 per fathom, being 226·9 feet as total east of winze, and is without change to note. 130 fathom east rise was risen 16 feet by four men at 875 per fathom, and is holed to the 120 fathom east No. 1 winze. This has now laid open a good section of mineral ground for stoking, 120 fathom west end was driven during a part of the month 11·7 feet by two men at \$35 per fathom, being 510·8 feet as total west of the engine shaft, and is unchanged. 120 fathom west back stopes were stopped 21·5 feet by four men at \$29 per fathom, and yielded as usual. 120 fathom east end from crosscut was driven 7·5 feet by two men at \$50 per fathom, and the lode continues unsettled. 120 fathom east back stopes No. 1 were stopped 18·3 feet by four men on company account, and yielded well. 110 fathom east end was driven 23·3 feet by four men at \$75 per fathom, being 636·9 feet as total east of the engine shaft. During the last few feet of driving the lode has yielded some good stones of mineral, and the general tone of lode seems to warrant a further improvement. 110 fathom east back stopes, No. 1, were stopped 15·8 feet by two men at \$26 per fathom, and yielded as usual. 110 fathom east back stopes, No. 1A, were stopped 9 feet on company account, and yielded well. 110 fathom east back stopes, No. 3, were stopped 56 feet by four men at \$23 per fathom, and yielded as usual. 110 fathom east stopes, No. 3A, were stopped 65 feet by four men at \$22 per fathom, and yielded well. 110 fathom east back stopes No. 2 were stopped 70 feet by four men at \$25 per fathom and yielded well, 100 fathom east stopes were stopped 62·8 feet by four men at \$18 per fathom and yielded well. 100 fathom east sink was sunk 6·2 feet on company account and yielded 4 tons of mineral per fathom. The object of this is to hole to the 110 east back stopes No. 3 in order to fill same with leads. 90 fathom east end was driven 26·2 feet by four men at \$53 per fathom, being 781·8 feet as total east of the engine shaft, and has yielded 1 ton 10 cwt. of high grade mineral per fathom. From the general character and strength of the lode in forebreast it seems that we may fairly expect the mineral to continue to improve. 90 fathom east end (Welton's lode) was driven 26·3 feet by four men and a boring machine at \$75 per fathom. The lode is about 3 feet wide and rather promising. Shallow adit was driven 24 feet by four men at \$40 per fathom, being 1095·1 feet in total length. The lode is yet unsettled. Straightening Mouth of Shallow adit: West driven 51 feet by five men at \$38 per fathom. Crosscut to new lode was driven 12 feet by two men at \$90 per fathom, being 364·3 feet in total length, and at this point it intersected a vein of lode stuff 4 inches wide that gave some good stones of mineral. It is decided to further continue cross-cutting in hope of cutting more lode. Real de Frias: Deep adit west was driven 15·5 feet as total distance from shaft, and the lode is without change to note. Old Spanish Cross-cut: This is situated north of the mine, and was cleared for 120 feet in length from its mouth. We intend clearing this to its end in order to prove the extent of workings upon the lodes in this part of the mine.

**HENRY NOURSE.**—The directors submit the following summary of operations for the month of December,

**ALAMILLOS.**—Mine report dated February 14: The 160 fathoms level driving west of Taylor's engine shaft. The lode produces no lead. In the 100 west of Judd's engine shaft the lode has fallen off in value. The lode in the 100 east of the same shaft is wider and contains stones of lead. Isidoro's winze sinking below the 70 fathoms level, worth 1 ton per fathom, this is a fine wide lode yielding good stones of lead.

**BONNIE DUNDEE.**—Mine manager's report for fortnight ending December 30: We have had five men stoping east of winze from No. 7 south west level on an average of 18 inches of reef. The reef is well defined and carries very heavy mineral, and is, I am satisfied, payable stone. We are leaving good reef under foot, and the reef certainly has a more permanent appearance than it ever had since we started working this block. The crosscut which is already in a distance of 127 feet from shaft at No. 8 level, should intersect this reef in a further distance of about 30 feet. Judging by the appearance of the workings this crosscut should intersect a valuable run of ground. We have had four men stoping from back of crosscut from No. 9 south west level. There is no change here. There is still from 8 inches to 1 foot of reef in hard formation. The stone should crush about 1 ounce to the ton. Have had two men stoping over the back of No. 5 south west level. The reef is about 1 foot thick good payable stone. Have raised about 40 tons of stone for a week, making total in hopper, and carted to the mill 180 tons. Have sunk the No. 3 straight shaft a further depth of 10 feet for a week without the rock drills, making a total of 332 feet from surface. Shall start with three rock drills in the shaft on Tuesday next, when we hope to make good headway with the sinking. The machinery and gear is now in first-class order. Crushing reported 15th January 219 tons, 232 ounces of gold; approximate value £750.

**CHAMPION REEF.**—Fortnightly report of Captain James Rowe, superintendent, dated January 31: Dalzell's shaft has been sunk 12 feet, total depth 650 feet 9 inches. Lode 3 feet wide assaying 1 ounce of gold per ton. 620 feet level north has been driven 40 feet 6 inches, total length 239 feet. Lode 2 wide assaying 1 ounce 12 dwts. of gold per ton. Winze below level sunk 7 feet, total depth 17 feet 6 inches. Lode 2 feet wide assaying 1 ounce 5 dwts. 20 grains of gold per ton. Winze below 620 south sunk 13 feet 6 inches, total depth 25 feet. Lode 1 foot wide assaying 1 ounce 2 dwts. of gold per ton. Garland's shaft has been sunk in the dyke 15 feet, total depth 614 feet 9 inches. The 530 feet level north of west crosscut has been driven 33 feet, total length 185 feet 6 inches. Lode 2 1/2 feet wide assaying 2 ounces 2 dwts. 3 grains of gold per ton. No. 1 rise in back of level risen 12 feet 6 inches, total height 22 feet. This is communicated with winze below 440 north of west crosscut. The 530 feet level south of west crosscut has been driven 10 feet 8 inches. Lode 1 foot 6 inches wide assaying 1 ounce 9 dwts. 8 grains of gold per ton. Winze below 530 south of shaft sunk 10 feet 6 inches, total depth 99 feet 6 inches. This having met with the dyke is suspended. Rise in back of level risen 3 feet 6 inches, total height 50 feet. Lode 4 feet wide assaying 1 ounce of gold per ton. The 440 feet level south of west crosscut north of shaft has been driven 19 feet 6 inches, total length 267 feet 3 inches. The lode during the last few days has been pinched to a mere stringer of quartz. Crosscut east of this level has been driven 7 feet, total length 17 feet. Not having met with any other part of the lode we have suspended same. No. 1 winze below level sunk 6 feet, total depth 58 feet 9 inches. This is communicated with rise in back of 530 north. No. 2 new winze below level (150 feet north of No. 1 winze) sunk 4 feet 6 inches. Lode for part carried 4 feet wide, assays 17 dwts. 2 grains of gold per ton. 340 feet level north of west crosscut has been driven 28 feet 3 inches, total length 620 feet 10 inches. Lode 1 foot wide, assaying 1 ounce 10 dwts. 13 grains of gold per ton. No. 2 new winze below level 150 feet north of No. 1 winze sunk 4 feet 3 inches. Lode 2 feet wide, assaying 2 ounces 2 dwts. 11 grains of gold per ton. No. 2 rise in back of 240 north of west crosscut north of shaft risen 4 feet total height 43 feet. Lode 4 feet wide assaying 2 ounces 12 dwts. of gold per ton. Ribblehead's shaft has been sunk 8 feet, total depth 159 feet 6 inches. Lode small and without value. 440 south driven 15 feet, total length 209 feet 3 inches. Lode small and without value. 340 feet level south driven 13 feet 3 inches, total length 452 feet 5 inches. This end is now in the east and west dyke. Winze below 340 north on fold sunk 20 feet 3 inches, total depth 25 feet 9 inches. Lode 4 feet wide, assaying 1 ounce 8 dwts. 4 grains of gold per ton. No. 2 rise in back of 340 north on slope of fold risen 18 feet 9 inches, total 86 feet 9 inches. Lode 3 feet wide, assaying 1 ounce 12 dwts. 7 grains of gold per ton. 200 feet level north of No. 2 rise in back of 240 south of shaft driven 16 feet 8 inches, total length 180 feet 2 inches. Lode 5 feet wide assaying 1 ounce of gold per ton. Rise in back of level risen 13 feet 6 inches, total height 79 feet. Lode 3 feet wide, assaying 1 ounce 12 dwts. 7 grains of gold per ton. The 200 feet level south of No. 1 rise in back of 240 north has been driven 15 feet 3 inches, total length 85 feet 9 inches. Lode 1 foot 6 inches wide, assaying 1 ounce 1 dwts. 5 grains of gold per ton. The 315 level north of Carmichael's shaft has been driven 23 feet 9 inches, total length 437 feet. This end is in the east and west dyke. Rise above 315 south of crosscut west of shaft to communicate with vertical shaft has been put up 14 feet, total height 23 feet. Rowe's shaft has been sunk 10 feet, total depth below 225 feet level 68 feet 6 inches. Lode 1 foot 6 inches wide, assaying 2 ounces 15 dwts. 5 grains of gold per ton.—Health: The health of the employees is fairly good.

**CRAVEN'S CALEDONIA.**—The following fortnightly report has been received from the mine, dated Charters Towers, January 4: During the past fortnight the No. 3 level has been extended a further distance of 7 feet by three men on wages making the total distance 143 feet from slide. The reef in this level is about 1 foot thick. In No. 1 and 2 stopes it is about 9 inches and in Nos. 3, 4 and 5 stopes there is about 8 inches of stone. In No. 8 level there has been nothing done since last measurement. In Nos. 1, 2 and 3 stopes the reef will average about 10 inches, and in the other three it will average about 8 inches. No. 7 level has been extended a further distance of 5 feet which makes a total of 411 feet from the slide and there is about 6 inches of reef in the face with small formation, and there is still a little water. I stopped this drive until I find out the proper distance to the boundary. In the first three stopes over this level the reef will average about 6 inches, but in the other two it will average about 8 inches. No. 6 level has been extended a further distance of 7 feet, which makes a total of 288 feet from the slide and as we have holed through into No. 7 stopes we will be able to pull the quartz from this level instead of throwing it down the passes to No. 7 level. The haulage of quartz for the past fortnight was 92 tons which makes a total of 605 tons for the present crushing. The holidays and repairs account for the small haulage of quartz.—Signed, G. Cahas.

**COROMANDEL GOLD.**—Superintendent's report for fortnight ending January 27: Coromandel shaft, 420 feet crosscut west: This has been extended a further 9 feet 6 inches, total 56 feet and having intersected the lode is suspended. When first seen this lode was 1 foot 6 inches wide, 12 feet has since been driven on its course northwards and the lode in present end is 1 foot 3 inches wide, average assay of quartz 1 ounce 3 dwts. per ton. 320 feet level north driven during fortnight 27 feet 6 inches, total 232 feet. Lode 1 foot wide, assay value 16 dwts. per ton. Prospect Shaft: Since last report the sump has been cleared up and shaft set to sink below the 440 feet with two drills. Winze under 440 feet north sunk 20 feet, total depth 90 feet, no lode in bottom. 440 feet south of crosscut east driven during fortnight 31 feet 6 inches, total 91 feet 6 inches. There is about 8 inches of quartz in the present end, and this assays 2 ounces 4 dwts. per ton. As the end approaches the crosscut the character of the lode is changing and we look for an early increase in size.

**DON PEDRO.**—Mine report No. 1, January 1st to 15th: January 17: On taking charge of the mine at the commencement of the year I found in operation mineral producing stopes Nos. 1 and 2 south of the 80 fathom level, and a drivage for the purpose of exploring the lode north of No. 8 stope, which is north of the 80 fathom level. At the 40 fathom horizon reached by a vertical rise a horizontal drivage south and an inclined drivage east a stope (un-named) west and south of C stope, and being carried in the same direction as C stope, viz. east.—Unproductive: At the 60 fathom horizon a cross

cut started 9 feet from the end of and at right angles to what was called the north drivage, and being driven in a south easterly direction. The opening up of the 50 fathom level and crosscut which were so small in places as almost to prevent trammimg. In Gordon's shaft the renewal of some of the sets which have become too weak through decay to longer support the back and similar work in the part of the old adit level, which is our water way until the completion of the new adit. The points now being worked are:—Stopes Nos. 1 and 2 are on the No. 8 shoot, the No. 1 carrying the southern boundary and the bottoms of both being on the footwall of lode, which at this point is of good quality. No. 2 stope comprises the greater part of what was No. 3, the rest of which is being carried by No. 4 stope. I have reopened No. 4 stope, which is south of the 50 fathom level, and shall carry it down to the breast of No. 5. The lode here is of very good quality. Stope No. 8 has also been restarted and is being carried east, yielding at present low grade mineral. The drivage north of the 50 fathom level is suspended as sufficient ground has been opened up to permit the starting of two stopes north of No. 8 as opportunity arises. The stopes west and south of No. 6 stope has also been suspended, as at present the mineral broken in it would require far too much handling to permit of its being payably worked. When No. 4 stope has been carried further east a rise can be put up and the mineral delivered directly to the 50 fathom level, 60 fathom cross cut as before stated there was being driven a cross cut at right angles to the north drivage. This has been suspended for the moment, and the driving of the main cross cut resumed. The work of enlarging the parts of the 50 fathom level and cross cut, which had contracted, is still in hand and the renewal of timber in Gordon's shaft and in the part of the old adit level still in use is continued.

**FRONTINO AND BOLIVIA.**—La Salada, January 7: Silencio: Work has been resumed in the 400 feet levels north and south, and a better class ore is being mined. The pumps are working well. Very shortly we shall (barring other mishaps) be able to proceed with the shaft sinking. The 400 north carries a lode 2 feet wide of medium class quartz. In the 400 south there is almost 3 feet of a similar quality ore. We think, however, that a portion of the lode is still standing in the eastern side. The 340 south yields as last reported, the quartz is harder and carries little or no pyrite. The lode has not yet been reached in the cross cut west from the 340 level north. This intersection, however, may be expected shortly, the country has in the past few days assumed a more congenial character, and small veins of quartz are occasionally seen. The 286 south still continues in unproductive ground, the formation, however, is large and has a congenial appearance. Calcite occurs disseminated throughout the lode. The winze lode in the bottom of the level has fallen off, being smaller and carrying less pyrites. The ventilation winze is making fair progress. The stopes throughout the mine are in a satisfactory condition, and the daily returns from the mill are steadily increasing.

It is intended to fix immediately, at the 400 feet level, an 8 inch plunger lift to replace the drawing lift now in operation. In re-timbering the old section of the south shaft, heavy ground has been met with, this has delayed progress somewhat.—La Salada: Although the actual communication has not been made, the ground between the crosscuts is so shattered that the water dammed in the mine is coming through in torrents, keeping the 10 inch plunger in constant work. This water, having been in deposit so long, is patrid, and the men are unable to work uninterrupted. There is an amount of mineral already broken in the mine, and this can be extracted immediately on boling. The hoisting gear referred to in last letter is now in course of erection. This is an improved hoist for horse-power, and will, it is anticipated, enable us to carry on the work until the new steam-hoisting gear is erected.—Cordoba: The advance in the No. 8 cross cut is satisfactory, the ground being easier. The No. 7 south has further improved, the lode is now 4 feet wide of good ore. The treatment of this mineral has given an increased daily yield from the mill, and the prospects for the present month have improved. The No. 7 north carries a large lode, but there is less pyrites. No change in the stopes to report.—Tigrito, Marmajon, and Marmajito: The cross cut at La Humedad has been advanced satisfactorily in easier ground. The new mill is almost completed, the bubbles for sand concentration being now in hand. The mineral, referred to in letter of 6th December, will be treated in the mill, until the lode is intersected in the new cross cut. In Marmajon and Marmajito everything goes on as last reported.—General: The section of Cecilia leased to the tributary of El Salto Mine has not given an improved yield. We have arranged to dismount the Californian mill for transport to Maria Dama. Although the rainy season is practically over, the damages on the watercourses have not all been put in good order. This is, however, being proceeded with, and things will be in their usual condition in a very short time. The inventories and the usual six-monthly report are now in hand, for the mail of the 22nd inst.

**FORTUNA.**—Mine report dated February 14: Canada Incosa Mine: The lode in the 150 fathoms level driving west of O'Shea's engine shaft, worth 2 tons per fathom, is strong and regular. In the 110 west of San Pedro's shaft the lode has declined in value and is now worth 1/2 ton per fathom.—Los Salidos Mine: The 200 east of Taylor's engine shaft worth 1 1/2 ton per fathom. The lode continues to open up good stoping ground. The lode in the 105 east of Palgrave's shaft has become small and unproductive. The stopes have undergone no change of importance during the past month. Surface works are kept on very regularly, and the machinery is in good working order. Estimated raisings for February 250 tons. The tributaries returned 67 tons of mineral in the past month.

**GOLD FIELDS OF MASHONALAND.**—The mail just to hand bring some interesting accounts from Captain Morish, the company's manager at the Cotopaxi mine announcing hostilities having now ceased, that the erection of the 10 stamp battery had been practically completed and regular crushings would, consequently, soon follow. The development of the reefs in the mine continues to give much satisfaction, laying bare large quantities of payable rock. Capain Morish further reports that he had taken a series of average samples from the Alice mine also belonging to this company, which he had assayed and obtained the following results:—Casing hanging wall 1 ounce 10 dwts. 2 grains per ton; general sample of reef 3 ounces 6 dwts. 7 grains per ton; sample from the tailings from 30 tons of ore crushed 13 ounces 4 dwts. per ton.

**GOLD FIELDS OF MYSORE.**—Mine report for fortnight ending 9th January: Oriental Lode, South Shaft: The 470 feet level north has been driven 4 feet 6 inches, total length 58 feet 6 inches. Lode 3 feet wide, assaying 15 dwts. of gold per ton. 470 feet level south driven 4 feet 6 inches, total length 53 feet. Lode 1 foot 6 inches wide assaying 1 ounce 3 dwts. 14 grains of gold per ton. The 380 feet level north has been driven 4 feet, total length 168 feet 4 inches. Lode 1 foot wide assaying 1 ounce 18 dwts. of gold per ton. 380 feet level south driven 5 feet 6 inches, total length 140 feet 3 inches. Lode 3 feet wide assaying 1 ounce 2 dwts. 23 grains of gold per ton. The 280 cross cut east of shaft has been driven 4 feet 6 inches, total length 204 feet 3 inches. Strata in present end is very hard.—Prospecting Work: There is no change in this department since my report of last week.

**KEMPINKOTE.**—Superintendent's report for fortnight ending 30th January: Garland's shaft has only been sunk 2 feet, making a total depth of 116 feet 3 inches. We have been busy about the pit work, which is now fixed and ready. The engine is erected, and the pump will be started as soon as some additions are completed, which owing to the nature of the ground it has been found necessary to make to the loading. Henty's shaft has been sunk 10 feet, making a total depth of 148 feet 6 inches. The lode is about 3 feet wide, and is a little mixed with country rock. The large body of quartz near the hanging wall is of low grade, but one of the small branches near the footwall is worth 1/2 an ounce to the ton. We are greatly troubled with the walls, which are very heavy, and we have to keep the timber right down to the bottom of the shaft. Prospecting: No. 4 pit has been sunk 23 feet, making a total depth of 32 feet. We are still in old workings, but as we are now down to the water level we have commenced to drive. The north end has been driven 10 feet 6 inches, and the south end 14 feet. No. 5 pit has been sunk 29 feet.

**EAGLEHAWK CONSOLIDATED.**—The following is an abstract from the Mine Manager's report, dated Maldon, 30th December, 1893:—"We have taken the air winch below, and got it fixed and working satisfactorily. We got the air pipes fixed in the Limited shaft and connected to the winch, and down the shaft we have got the penthouse in and the shaft timbered to the bottom of the pit, and the contractors have made a start to cut the plat at the 725 feet level. We have started the new engine and do the winding through the Limited shaft now. The tributaries Smith and party are on a little gold now, but it is very narrow. Harris and party had another small crushing that went very poor; they think they are on a little better drift now. Sampson and party are breaking quartz, and last week they got a little better prospect of gold, but not very payable yet."

**LINARES LEAD.**—Mine report dated February 14: Pozo Ancho Mine: The lode in the 200 fathom level driving west of Peill's engine shaft is small consisting chiefly of carbonate of lime and yielding a little ore, worth 1/2 ton per fathom. In the 155 west of the same shaft there is no improvement. The 178 west of Warne's cross cut the lode is large and strong and spotted throughout with lead ore. No. 275 winze below the 135 worth 1/2 ton per fathom. The lode is small and the ground hard for sinking through.—Los Quinton Mine: Taylor's Engine Shaft: In the 185 south the granite is hard for driving through. The lode in the 165 east is more open than it was, and yielding good stones of ore worth 1/2 ton per fathom. The 150 east is worth 4 tons per fathom; this is opening up valuable ore ground. In the 130 east the lode has declined in value during the past fortnight. Martos winze sinking below the 150 will be holed to the 165 fathom level in a few days.

**MILLS' DAY DAWN UNITED.**—Mine manager's report for fortnight ending January 2nd: No. 8 level west has been driven 20 feet. There is 2 feet of formation on the hanging wall intermixed with quartz. Expect this level to hole to the winze from No. 7 about the end of this week. No. 7 Level West: On the hanging wall the winze is deepened 23 feet. The stopes over the level vary in thickness from 1 to 5 feet of reef of medium quality. No. 7 Level West: Footwall section extended 7 feet, carrying a reef 6 feet. In the stopes the reef ranges from 6 to 10 feet of fair quality. No. 6 Level East: The stopes over this level vary in width from 2 to 4 feet of fair quality. No. 6 Level West: Stopes on both sections continue much the same as last reported—from 2 to 5 feet thick of fair quality. No. 5 Level West: The Monkey shaft has been sunk 5 feet. The reef in the stopes ranges from 2 to 5 feet wide of fair quality. In the eastern stopes the reef varies from 2 to 5 feet. The winze is sunk 27 feet. There is no reef at present here. No. 4 Level West: The reef in the stopes varies in width from 2 to 8 feet of fair quality. The stopes on the eastern side range from 2 to 5 feet. There has been a general overhaul and repairing of machinery and boilers, and everything in connection with the machinery is in good order.

**MYSORE WYNAAD CONSOLIDATED.**—The following summary, received by mail from the mining manager in India, shows the work done during the month of January, 1894:—Workings: North shaft, 350 feet level south, ground cut 29 feet; 350 south, No. 3 cross cut west, ground cut 36 feet, assay value 1 dwt.; 350 south, No. 3 cross cut east, ground cut 2 feet.—South shaft, 354 south, ground cut 17 feet, size of lode 6 inches, assay value 1 dwt.; 354 north, ground cut 23 feet, size of lode 2 feet 6 inches, assay value 12 dwts.; 354 north winze, ground cut 2 feet; 354 north stope, ground cut 3 feet; total ground cut, 112 feet.

**MYSORE REEFS.**—Extract of letter from Captain Scantlebury, mine agent, dated January 31: Yesterday I cabled you as follows: Underlie shaft, width of lode 3 feet 9 inches, average of five assays 1 ounce 19 dwts. of gold per ton, which I am sure you will think is satisfactory. I enclose Mr. Opie's certificate, wherein you will observe that the quartz is very rich against the hanging wall. You will also see that the smalls from the heap gave nearly 2 ounces of gold to the ton. When I telegraphed yesterday that the lode was 3 feet 9 inches I mean, of course, the productive portion, but the actual width of the lode is now 5 feet.

**MOSMAN GOLD.**—Mine manager's report for fortnight ending January 4th: North Australian Mine: Byerley level winze has been sunk 6 feet, total depth from level 56 feet. There is no stone at present in the bottom, but appearances lead to the belief that a make of quartz may be met with at any time.—Stopes: The usual amount of quartz is being obtained from the various stopes. The reef is small, and the rock hard for working. Stone Raised: 45 tons have been raised during the fortnight. Stone Crushed: The final clean up, after crushing 328 tons, took place on the 29th ult. for a yield of 545 ounces 2 dwts. of gold. (Crushing reported 2nd January 328 tons for 545 ounces gold, approximate value £1850.) Wyndham Mine: Main underlie shaft has been deepened 10 feet, total depth from No. 12 plat 128 feet. There is no stone in present bottom. The waterstop makes it troublesome. A contract has been let to sink a winze 100 feet in the No. 12 level north at 17s. per foot and 22 feet have been sunk. The reef which was about 1 foot thick at the commencement is now 2 1/2 feet and heavily charged with mineral worth say 2 ounces per ton. No. 8 level north extended 12 feet, total from shaft 277 feet. This level has passed through the slide and is being continued along footwall. Indications are favourable for stone being met with at no great distance.—Stopes: In a stope over No. 12 level a short distance from shaft the reef is 2 feet thick, worth say 1/2 ounce per ton. Over same level north of winze reef is 9 inches thick, worth say 12 dwts. per ton. Over No. 11 level north the stone is about 1 foot thick, very white, worth say 13 dwts. per ton. Over No. 9 level south of shaft reef is from 6 inches to 2 feet thick worth say 1 ounce per ton. About 160 tons of stone have been broken during fortnight, total in hand, including stone at mill 450 tons.

**MOUNT ZEEHAN (TAS).**—Manager writes for week ended 9th January: Argent Section: Main Engine Shaft, No. 6 Lode, 72 feet Level North: Stope in the back of level continued, but mill being idle have raised no ore in the meantime. Lode is about 2 feet wide, carrying good ore with a small quantity of flints.—No. 4 Lode, 72 feet Level North: Stope in back of level continued, but ore is kept below for the present. The 132 feet level south on this lode has been driven 5 feet. No change of consequence. Whip shaft south on this lode has been sunk 5 feet, total 20 feet. Lode is from 1 foot 6 inches to 2 feet 6 inches wide and improving, carrying a branch of good ore, with more galena disseminated throughout the remaining part.—192 feet Level North-East Drive: Have crossed west 9 feet, and passed through some stringers of galena and pyrites.—Surface Work: Have covered in mill boiler after overhaul, and have relaid ore house floor. We have also made a general overhaul of the machinery. Pumping engine is working well.

**NAMAQUA COPPER.**—Abstract of superintendent's report for December: Twentfontein Mine: 115 fathom level north the ground driven through contains copper ore, but not enough can be seen to estimate its value. 105 fathom level west copper has been continuous throughout the month. Both the drivings are over 9 feet in height and breadth. Worth 8 tons of ore per fathom. 105 fathom level east in cutting southward the south wall of the ore ground has apparently been met with. In driving eastward the bottom half of the level showed chiefly quartz, while the upper half was in good ore ground. The quartz is now disappearing with the probability of the return of a full height of good copper ground. Worth 7 tons of ore per fathom. 105 fathom level No. 24 winze, a winze has been commenced farther west than the former one, which will be sunk 9 fathoms to reach the 115 fathom level. Worth 7 tons of ore per fathom. 95 fathom level west the lode does not improve at this point, although it has a promising appearance. Worth 2 tons of ore per fathom. 85 fathom level west good faces of copper are found between the joints in the rock.—Stopes: 105 fathom level stopes have yielded well during the month. The development has been chiefly on the south side of the level west of the bottom of the No. 2

Shaft: The rock now being sunk in is hard and mineralised, at times showing spots of ore, but nothing further.—Output for January: 400 tons of ore of 28 per cent.

**NO. 7 NORTH EAST QUEEN.**—The following report has been received from the mine, dated Charters Towers, January 5: During the fortnight the tributaries below No. 3 level have given up their tribute. Heath and party are underhand stoning in No. 3 western level on a reef varying from 12 to 18 inches in thickness. Eddy and party have taken a block over same; the reef is from 6 to 12 inches in thickness. Both parties are at present crushing. Hall and party are working on from 9 to 15 inches of fair looking stone under No. 1 western level. Milton and party under No. 1 eastern level got 9 inches of stone in the face. Total amount of stone raised during the fortnight about 36 tons. (Signed) H. Davis.

**OREGUM.**—Superintendent's report for fortnight ending January 30: Taylor's shaft: The shaftmen have completed the timbering of the shaft, laid the tram road across the plat at the 460 feet levels, cleaned up the shaft and resumed sinking, but nothing measured for the report to-day. 460 feet level south advanced 29 feet, total 74 feet. Lode 2 feet, value 1 ounce 12 dwts. per ton. 360 feet level south advanced 4 feet, total 516 feet 3 inches. Lode 6 inches assaying 13 dwts. 2 grains per ton. No. 1 winze 360 feet level south sunk 7 feet 6 inches, total 63 feet 6 inches. Lode 2 feet, value 2 ounces 4 dwts. 18 grains, now communicated with 460 feet level. No. 2 winze 360 feet level south sunk 7 feet 3 inches, total 75 feet. Lode 1 foot 6 inches, value 1 ounce 5 dwts. per ton. No. 3 winze sunk 7 feet, total 32 feet 6 inches. Lode 4 feet, value 1 ounce 7 dwts. 5 grains per ton. Wallroth's shaft: 760 feet level south advanced 6 feet 6 inches, total 30 feet. Lode 1 foot 3 inches, value 2 ounces 14 dwts. 10 grains. 760 feet level north advanced 10 feet 9 inches, total 33 feet 3 inches. Lode 1 foot 3 inches, value 1 ounce 17 grains. Both ends have been suspended, and the shaftmen put to cut the plats at the 760 feet levels. When these are completed the levels will be resumed. 660 feet level south advanced 30 feet 6 inches, total 320 feet. Lode 1 foot 4 inches, value 13 dwts. 2 grains. No. 1 winze 660 feet level south sunk 3 feet, total 31 feet 6 inches. Lode 1 foot 9 inches, value 2 ounces 1 dwt. 6 grains. No. 2 winze commenced, 6 feet sunk. Lode 1 foot, value 9 dwts. 19 grains. No. 1 winze 660 feet level north sunk 1 foot 9 inches, total 25 feet 6 inches. Lode 3 feet, value 2 ounces 15 dwts. 12 grains. No. 1 rise 660 feet level north 8 feet 6 inches risen, total 36 feet 6 inches. Lode 2 feet, value 2 ounces 13 dwts. 10 grains. 560 feet level south advanced 28 feet 3 inches, total 715 feet 9 inches. Lode 1 foot 9 inches, value 1 ounce 7 dwts. 10 grains. No. 2 winze 560 feet level south sunk 2 feet 9 inches, total 42 feet 9 inches. Lode 9 inches, value 1 ounce 1 dwt. 19 grains. No. 3 winze same level sunk 3 feet 3 inches, total 41 feet. Lode 10 inches, value 2 ounces 1 dwt. 6 grains. No. 4 winze sunk 6 feet 3 inches, total 40 feet. Lode 2 feet, value 10 dwts. 21 grains. No. 5 winze sunk 6 feet 6 inches, total 12 feet 6 inches. Lode 3 feet 6 inches, value 12 dwts. No. 6 winze commenced 2 feet sunk. Lode 2 feet 6 inches. No sample taken. No. 3 rise 560 feet level south 1 foot 9 inches risen, total 49 feet 3 inches. Lode 1 foot, value 3 ounces 5 dwts. 8 grains. No. 4 rise same level 4 feet 3 inches risen, total 32 feet 9 inches. Lode 3 feet value 2 ounces 7 dwts. 1 grain. No. 4 winze 460 feet level south sunk 6 feet 6 inches, total 56 feet. Lode 2 feet 6 inches, value 2 ounces 10 dwts. 2 grains. No. 5 winze same level sunk 5 feet 6 inches, total 76 feet. Lode 2 feet, value 1 ounce 1 dwt. 19 grains. No. 6 winze sunk 6 feet 6 inches, total 47 feet 3 inches. Lode 1 foot 6 inches, value 2 ounces 3 dwts. 13 grains. No. 7 winze sunk 6 feet, total 38 feet 3 inches. Lode 2 feet, value 1 ounce 1 dwt. 19 grains. On exploring the old workings intersected some months ago in the 215 feet level north we found where the lode came to an abrupt termination that the quartz had folded back in the footwall. We put a rock drill to follow it and found its direction to be south-east. We have driven on its course 22 feet. The lode is 1 foot 3 inches wide assaying 15 ounces 19 dwts. 21 grains per ton and previous washes we have had confirm this value. This we regard as an important point of development which may throw light on the deeper workings in this part of the mine. Low's shaft has been sunk 5 feet 9 inches, total 534 feet 1 inch. 510 feet level south advanced 9 feet, total 69 feet 6 inches. Lode 3 inches wide, value 6 dwts. 12 grains per ton. Intermediate level north back 200 feet level south advanced 8 feet 6 inches, total 60 feet. Lode 1 foot, value 15 dwts. 6 grains. No. 2 winze 200 feet level north sunk 4 feet, total 70 feet 6 inches. Lode 6 inches, value 2 ounces 1 dwt. 9 grains.—Probyn's shaft: 950 feet level south commenced 7 feet 9 inches driven. We shall continue this level through the cross course soon after which we expect to intersect the lode. 950 feet level north from crosscut east advanced 14 feet 6 inches, total 19 feet. Lode 1 foot, value 10 dwts. 20 grains. 850 feet level south advanced 12 feet 6 inches, total 151 feet 9 inches. Lode 1 foot, value 8 dwts. 17 grains. No. 1 winze, 850 feet level south commenced, 2 feet sunk. Lode 1 foot, value 9 dwts. 19 grains per ton. No. 1 rise 850 feet level south commenced 2 feet risen. No lode.—Stopes for the month: Taylor's shaft back 360 feet level south stopped 36 fathoms. Lode 7 feet, value 1 ounce 5 dwts. 13 grains. Bottom 280 feet level south stopped 26 fathoms. Lode averages 6 feet wide, average value 1 ounce 13 dwts. Bottom 150 feet level north stopped 6 fathoms. Lode 2 feet, value 2 ounces 5 dwts. 17 grains. Back 150 feet level north stopped 13 fathoms. Lode 1 foot 9 inches value 1 ounce 13 dwts. 18 grains. Wallroth's shaft bottom 460 feet level north stopped 4 fathoms. Lode 2 feet, value 3 ounces 16 dwts. 5 grains. Bottom 360 feet level south stopped 40 fathoms. Lode averages 2 feet 3 inches, average value 2 ounces 7 dwts. 18 grains. Back 360 feet level south cut 2 fathoms. Lode 1 foot 3 inches, value 2 ounces 2 dwts. 11 grains. Bottom 360 feet level north stopped 4 fathoms. Lode 2 feet 3 inches, value 1 ounce 1 dwt. 19 grains. Bottom 280 feet level south stopped 17 fathoms. Lode 2 feet 6 inches, value 1 ounce 10 dwts. 23 grains. Bottom 280 feet level north stopped 5 fathoms. Lode 2 feet, value 2 ounces 3 dwts. 13 grains. Bottom 215 feet level north stopped 4 fathoms. Lode 1 foot 6 inches, value 2 ounces 14 dwts. 1 grain.—Probyn's shaft: Bottom 550 feet level south stopped 2 fathoms. Lode 2 feet, value 7 dwts. 14 grains. Back 550 feet level south stopped 12 fathoms. Lode 1 foot 6 inches, value 8 dwts. 17 grains. Bottom 450 feet level south stopped 13 fathoms. Lode 2 feet, value 2 ounces 3 dwts. 13 grains. Bottom 300 feet level south stopped 4 fathoms. Lode 1 foot 3 inches, value 2 ounces 5 dwts. 4 grains.—Exploratory Work: Wallroth's shaft: Cross west towards Monday's Lode from the 280 feet level south advanced 36 feet 6 inches, total 217 feet. No change in the ground.—Probyn's shaft: Crosscut east from the 450 feet level south advanced 21 feet 3 inches, total 91 feet. Ground very hard. No. 2 trial shaft sunk 5 feet 6 inches, total 192 feet 9 inches. Lode 4 feet, value 4 dwts. 21 grains per ton. Yesterday we observed a change in the lode. The quartz has altered its colour. It resembles that of the Champion Reef more than it has hitherto, and contains a large percentage of pyrites. We had a sample washed this morning which gave a fair show of gold.—Surface: The erection of No. 3 stamp mill is practically completed, and we now await the arrival of the engines. All the parts for No. 3 set of tailings machinery that have arrived are fixed in position. The remainder as well as the engines for same are on rails from Madras. No. 3 compressor is well in advance, and will be ready to work in about three weeks from this date.

**OSCAR GOLD.**—The following report has been received from the mine, dated Hangesund, February 12th: Hodgkinson's Lode: In the 500 north level the lode during the last few days has shown improvement, with quartz 2 feet wide running with the footwall. The quartz contains but little mineral, but some improvement in this respect is at present apparent. Assays show value 3 dwts. 6 grains gold per ton. The lode in intermediate level above 400 north has quartz over 3 feet in width; the same contains a quantity of copper and iron pyrite, with assay value 4 dwts. 13 grains gold per ton. We have commenced to sink in bottom of 400 north to communicate with 500 below, and so open up a good section of ground for stoning. The lode just now is very irregular in appearance, with quartz much mixed with the country rock. There is a considerable amount of mineral in the lode, chiefly iron pyrites. In the bottom of the 200 north the lode is over 4 feet wide. The quartz has an average width of 18 inches, and is increasing. Same con-

tains galena and copper pyrites, with occasional sights of gold. Two men are still stoning in back of 150 south, and have a nice run of quartz, about 15 inches wide, well mineralised, and assaying an average value of 5 dwts. 21 grains gold to the ton. Other workings are without alteration.

**PAHANG CORPORATION.**—January 3: I hereby submit to you progress report for the month of December. Pollock's Vertical Shaft: We were favoured with dry weather during part of past month, and the country rock being a little more favourable for sinking enabled us to make better progress. A distance of 18 feet was sunk, making the total depth from surface 169 feet. No. 1 below Adit: The drive west on the lode has been further advanced a distance of 45 feet, total length from crosscut 102 feet. The lode is 3 feet wide, and is producing good payable ore. I expect during this month to intersect the east winge sunk from the adit level when we will be able to haul the ore through it and send it to the stamps. The drive from Campbell's on Pollock's lode has been advanced a distance of 36 feet, total length 345 feet. During the early part of the month the lode was very small and poor. It has now opened out to 3 feet wide, and is producing very good ore. We have now a leading stope opened over this drive for a length of 50 feet from the western point of the payable ore. The lode will average 5 feet in width for a length of 30 feet, and is producing ore of first class quality. Beyond that point eastward it is not of so good quality but is good payable ore. The party of tributaries working in Kolam Dalam are still obtaining good payable ore.—Jeram Batang: The drive west in No. 2 above adit has been further advanced a distance of 37 feet, total length from crosscut 342 feet. The lode is still well defined and 2 feet wide, but is not carrying payable tin.—(Signed) Wm. Straghan.

**SHEBA.**—The following report has been received from the general manager for the month of December: Mine: Very little work is being done above No. 5 level, except prospecting the stopes for a higher quality of ore than they at present show, with the exception of No. 4 level west of the incline shaft, where we have stoned out some very good ore. Below No. 5 the mine looks well, especially on No. 6 level and in the bottom of the incline shaft. No. 7 level, the west drive was extended 18 feet in medium quality of ore. The east drive was extended 21 feet east of the incline shaft in low grade ore. No. 8 level driven west 33 feet; most of the way in low grade ore with occasional patches of good ore. Incline shaft, this was sunk a further 23 feet; the first half of the month being in very low grade ore, which steadily improved towards the end of the month, at which time the ore in the sink was very good, showing free gold, this was at 306 feet below the No. 5 level and at a point where we intend starting No. 9 level. Sheba low level shaft was sunk 11 feet, and at 140 feet deep a cross cut was driven north 21 feet to connect with the low level tunnel which is being driven in to tap the Sheba at No. 7 level, and then continue to the west end of the property. Oriental low level shaft is now ready for us to recommence sinking, which will be done as soon as we see the fuel supply is certain.—Incline air shaft: To connect with the low level tunnel this was sunk 13 feet 6 inches.—Surface at mine: An incline tramway of a quarter of a mile, extending from the mine storehouse up to the engine at the Oriental vertical shaft has been constructed for the purpose of hauling up fuel for the engine.—Hoisting engine: The 50 h.p. hoisting engine has been started up, and gives entire satisfaction.

**SUTHERLAND REEF.**—Advice has been received from the manager, Mr. Stephens, dated Johannesburg, 27th January, 1894, that he was about to purchase the necessary hauling gear for incline shafts. Mr. Stephens writes that he is "certain that the mine will prove a certain success and give very fair profits." As soon as the machinery was bought and loaded up Mr. Stephens intended to return at once to the mine and send a report of work done during January.

**SALISBURY GOLD.**—The manager reports on the workings for the month of December as follows:—Total number of feet driven, sunk, and risen, 430 feet 6 inches, made up as under:—South reef third level rise 2 east advanced 3 feet, total 47 feet 6 inches. South reef fourth level winze 1 east advanced 15 feet, total 68 feet 6 inches. South reef fifth level drive west advanced 66 feet 6 inches, total 188 feet 6 inches. South reef fifth level winze 1 east advanced 18 feet, total 18 feet. South reef fifth level cross cut drive south advanced 3 feet, total 3 feet. South reef fifth level drive west advanced 64 feet, total 216 feet. South reef fifth level winze 1 west advanced 18 feet, total 33 feet. South reef sixth level drive east advanced 68 feet, total 122 feet. South reef sixth level drive west advanced 52 feet, total 98 feet. South reef sixth level winze 1 west advanced 9 feet, total 9 feet. South reef sixth level cross cut south advanced 3 feet, total 3 feet. Main reef leader third level drive west advanced 7 feet, total 63 feet. Main reef leader third level winze 2 east advanced 4 feet, total 44 feet. Main reef leader fourth level drive west advanced 25 feet, total 43 feet. Main reef leader fourth level winze 1 east advanced 6 feet, total 69 feet. Main reef leader fifth level drive east advanced 42 feet, total 142 feet. Main reef leader fifth level rise 1 west advanced 20 feet 6 inches, total 93 feet 6 inches. Main reef leader sixth level drive east advanced 12 feet, total 18 feet 6 inches. Main reef leader sixth level drive west advanced 8 feet 6 inches, total 15 feet. Sump advanced 6 feet, total 6 feet.—Milling: The mill ran 29 days four hours; ore milled 2180 tons. Gold extracted from the battery 1185 ounces 2 dwts., gold extracted from the cyanide works 665 ounces 1 dwt, total 1850 ounces 3 dwts., value £5958 12s. 3d. Total working expenses per ton, including redemption £1 12s. 4d.; value of yield per ton £1 19s. 5d., expenditure on capital account £2664 2s. 9d., expenditure on revenue account £4914 17s. 7d., profit for the month, £1043 14s. 8d.

**ANGLO MEXICAN.**—Writing on the 21st January the manager says, respecting the newly-acquired gold mine at San Jose de Gracia: Guadalupe winze, No. 7, below Guadalupe tunnel: I am pleased to say that this winze continues to present the same favourable appearance as when last reported on. A sample of third-class ore taken from same assayed 74 ounces in gold and 44 ounces in silver per ton.—Guadalupe tunnel: The face of this tunnel shows fully 5 feet of good milling ore, which from present indications I judge will improve in value before long.—Ore shipments: The arrangements with the different parties for conveying the ore ready for shipment to Mazatlan have been completed, and with the special recommendations I have made, I have no doubt that from now on the freighting of the ores from San Jose to the coast will proceed without further interruption.

**ALMADA AND TIRITO.**—Report for the month ending January 27: Díos Padre: The 350 feet level north has been extended 42 feet 2 inches during the month by three men. The lode is wide and composed chiefly of quartz, but contains no ore. The 250 feet level north has undergone no change during the past fortnight. The lode is large and shows spots of ore at times, 23 feet 2 inches were driven during the month, making total length from crosscut 537 feet 5 inches. The 250 feet level south is being driven on a very massive lode of hard quartz with good spots of green ore. 3 feet 9 inches were driven; total 366 feet 6 inches. Pachecos winze sinking below the 250 feet level north has now a depth of 100 feet 6 inches, 15 feet 8 inches having been opened up this month. The lode is worth ½ ton and 62 ounces silver per ton. During the next week we shall commence to drive south from the bottom of this winze in order to communicate with the 350 feet level speedily.—Stopes: The stope in the back of the 156 feet level north of Cruz Verde shaft have yielded some good ore during the past fortnight, the grade varying from 120 to 220 ounces of silver per ton. 8½ fathoms were stoned and the present value of the lode is 2½ tons per fathom. The stope back of intermediate below 12 fathom level are yielding fairly well.

**UNITED GOLD FIELDS OF MANICA.**—Return of work done during fortnight ended December 30: Adit No. 1: Driven 4 feet 6 inches, still in very hard drilling and tough blasting schist, no timber used, total length driven to date 435 feet. Working day shift only and Christmas holidays account for the small amount of work done.—Adit No. 2: Driven 7 feet 6 inches in very hard drilling and blasting schist similar to No. 1; day shift only, no timber used. Total length driven 479 feet 6 inches.

## JOINT-STOCK COMPANIES.

### NEW REGISTRATIONS.

THE following are among the joint-stock companies registered at Somerset House since our last notice:—

**Transvaal and General Association (Limited).**—Registered 30th January, by Clarke, Rawlins and Co., 65, Gresham House, Old Broad Street, E.C. Capital £250,000 in £10 shares. Object: To carry on all kinds of exploration business, to search and obtain information in regard to mines, mining districts and localities; to purchase or otherwise acquire, and to sell, dispose of and deal with mines and mining rights; to work, exercise development and turn to account the same; to carry on all kinds of promotion business, and in particular to form, constitute, lend money to, assist and control any companies, associations or undertakings. The men of directors the conduct of the business of the company shall be in the hands of managers. The first are the Exploration Company (Limited), who will receive as remuneration 15 per cent of the net profits of the company in each year.

**Pallafiat Iron Ore Company (Limited).**—Registered by W. B. Peat and Co., 3, Lothbury, E.C., with a capital of £30,000 in £100 shares. Object to acquire and hold leasehold mines at Begriest, Cumberland, and to carry on business as ironmasters, colliery proprietors, &c. Most of the regulations contained in Table A apply.

**Las Cabases Manganese Mines (Limited).**—Registered by R. S. Taylor, Sons and Humbert, 4, Field Court, Gray's Inn, W.C., with a capital of £250,000 in £10 shares. Object, to acquire and turn to account the manganese mines known as Las Cabases, situated in the communes of Riverneurt, Espas, and Bimont, in the arrondissement of St. Giron, in the department of Ariège, France, and to carry on the business of miners and smelters in all or any of its branches. There shall not be less than five nor more than seven directors. The first are C. Simon, J. C. Swan, A. Simon, J. A. Game, W. Goetz, J. A. Duncan, and J. Macqueen. Qualification, £1000. Remuneration, £500 per annum and a percentage of the profits.

**Pontardawe, Brynoch, and Graigola Railways and Collieries Company (Limited).**—Registered by Sosie and David, Bridgend, Glamorganshire, with a capital of £17,500 in £5 shares. Object, to acquire and carry on the railway known as the Brynoch Little Pit and Wernddu Graigola Level, situated at Pontardawe and Brynoch, near Neath, Glamorganshire. There shall not be less than three nor more than seven directors; the first to be elected by the signatories to the Memorandum of Association. Qualification, £250. Registered 22nd January.

**Ayrondale Tin Plate Company (Limited).**—Registered by Le Brasseur and Oakley, 12, New Court, Grey Street, W.C., with a capital of £7000 in £100 shares. Object to acquire and carry on the business of a railway company, and as engineers. Table A mainly applies.

**St. Helens Bulawayo Association (Limited).**—Registered by H. S. Sugden, 5, Old Jarrow Chambers, E.C., with a capital of £10,000 in £100 shares. Object to acquire and turn to account mining properties in Matabeleland and Mashonaland. The first directors—to be not less than seven—are to be elected by the signatories to the Memorandum of Association. Qualification, £100. Remuneration to be fixed by the company.

**Torrance and Sons (Limited).**—Registered by Jordan and Sons, 120 Chancery Lane, W.C., with a capital of £50,000 in £10 shares. Object, to acquire and carry on the business of engineers and ironfounders hitherto carried on by Torrance and Sons, Bilton, Gloucestershire. The first directors—to be not less than two nor more than five—are to be appointed by the company in general meeting.

**Moria's Tin-Plate Company (Limited).**—Registered by Hudson and Kearns, 83, Southwark Street, S.E., with a capital of £25,000 in £100 shares. Object, to adopt an agreement, made January 4, between W. Williams and others of the one part and this company of the other part, and to carry on business as tin-plate manufacturers, ironmasters, &c. The first directors—to be not less than three nor more than five—are to be appointed by the signatories to the Memorandum of Association. Qualification, £500. Remuneration to be fixed by the company.

**Matabele Gold Alluvial Syndicate (Limited).**—Registered by G. G. Hawkes, 63, Queen Victoria Street, E.C., with a capital of £400 in £1 shares. Object to acquire and deal with the rights to which G. Durbin is or may be entitled as the registered first discoverer of payable gold bearing alluvial deposits within the territory comprised within the spheres of operations of the British South Africa Company. Table A mainly applies.

**Western Rhondda Railway Company (Limited).**—Registered by Arnold Williams and Co., The Vestry House, Laurence Pountney Hill, E.C., with a capital of £50,000 in £10 shares. Object, to carry on the business of a railway company in the county of Glamorgan. There shall not be less than four nor more than seven directors. The first are W. Masters, W. C. Shout, A. J. Lusty, and W. Digby. Qualification, 50 shares. Remuneration to be fixed by the company in general meeting.

**New African Company (Limited).**—Registered 3rd February by Hollams, Sons, Coward and Hawksley, Minning Lane, E.C. Capital £400,000 in £1 shares. Object, to carry on the business of merchants, contractors, carriers by land and water, farmers, graziers, traders, manufacturers, bankers, shipowners, managers of estates, farms, mines, railways and other properties, financial agents, brokers, engineers, miners, builders, &c. There shall not be less than two nor more than seven directors. The first are to be appointed by the signatories to the Memorandum of Association. Qualification, £1000. Remuneration, 1/10th part of the surplus profits after the payment of a cumulative dividend of 25 per cent, per annum on the paid up capital.

**Mexican Midland Railway (Limited).**—Registered by J. W. Young, Broad Street House, E.C., with a capital of £100,000 in £1 shares. Object, to construct and work tramways and railroads in Mexico and elsewhere. Registered without Articles of Association.

**Patent Weldless Steel Chain and Cable Company (Limited).**—Registered 10th February by Charles Double, 14, Sergeants' Inn, Temple, E.C. Agents for Hooper and Ryland, 13, Colmore Row, Birmingham, with a capital of £50,000 divided into 30,000 A and 21,000 B or deferred shares of £1 each. Objects: To adopt a provisional agreement dated 3rd February, 1894, and made between the Patent Weldless Steel Chain Company (Limited) and Joseph W. Davis, the liquidator, of the first part, the said Joseph W. Davis of the second part, and Walter Charlton, acting as the trustee for the



**THE TRADE OF INDIA.**—The annual circular of Messrs. D. J. Keymer and Co., contains much interesting information in regard to the trade of this country with India, Australia and the Cape. As to our trade with India, the circular says that "during the last three years there has been a check to the rapid increase of imports into India which formed so striking a feature of our previous reports. This is believed to be due to the sudden rise in the value of the rupee in 1890-1, followed by the equally sudden fall in 1891-92, and the steady and persistent fall since, greatly interfering with business. It is, however, satisfactory to notice that the latest reports from India for the six months ended September, 30, 1893, show a substantial increase over the corresponding six months of 1892, and this increase is spread over nearly all the articles imported. The same signs are shown in the substantial improvement in the value of the exports from England to India for the quarter ended December 31, 1893." The increasing proportion of the imports into India of iron and steel from Belgium and Germany is very striking. Ten years ago Great Britain practically had all this trade, but now the imports of iron from Great Britain are only just double those from Belgium and Germany, while in steel these two countries have outstripped Great Britain, India taking more from them than from this country. Germany and Belgium are also increasing their trade in hardware and cutlery. Great Britain, however, still holds the cotton trade in its hands.

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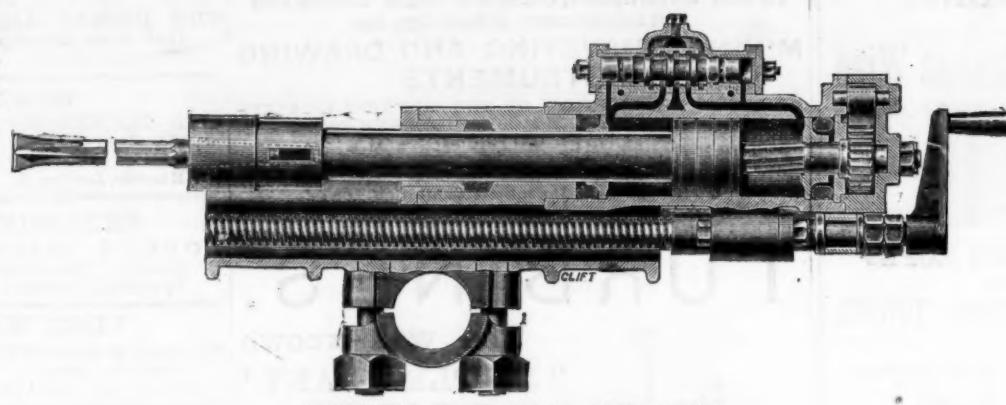
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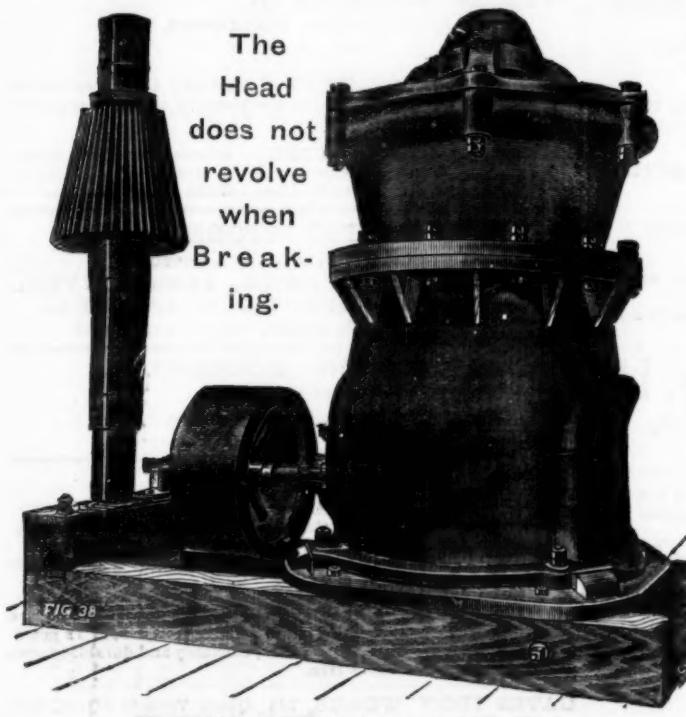
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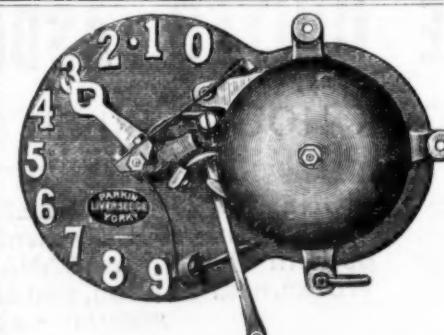
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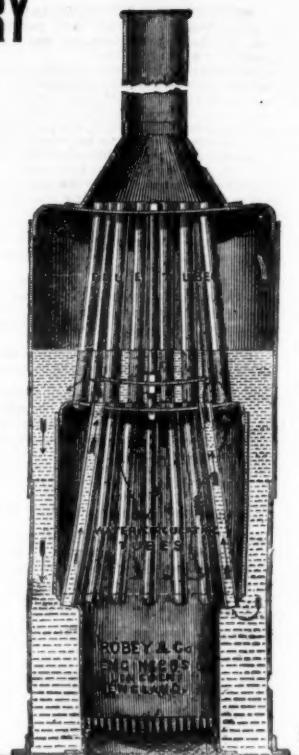
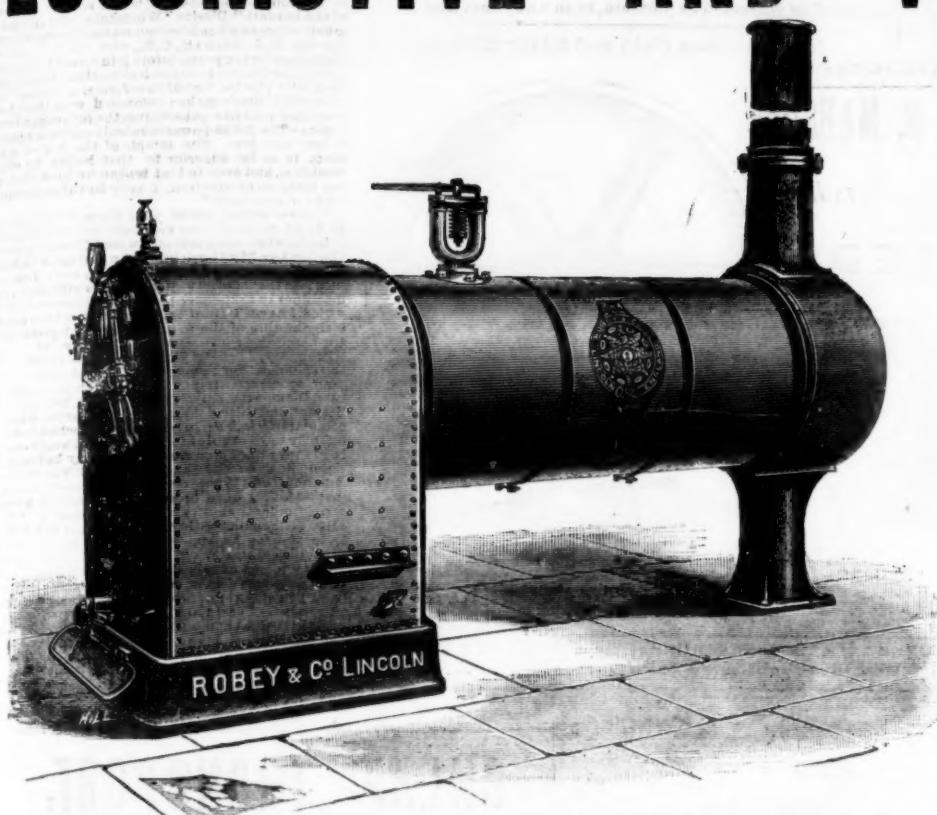
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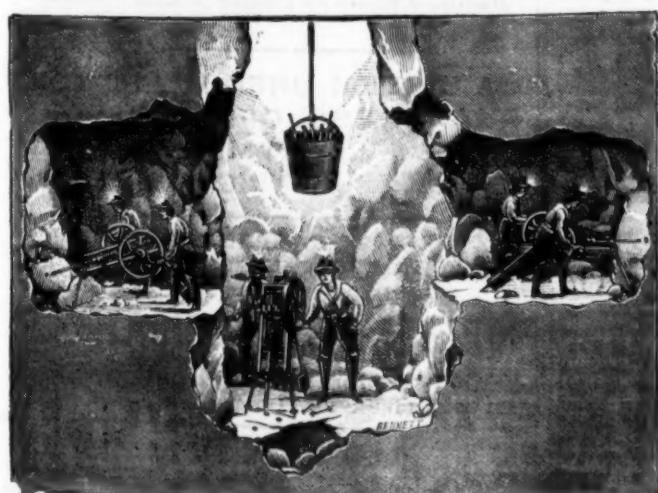


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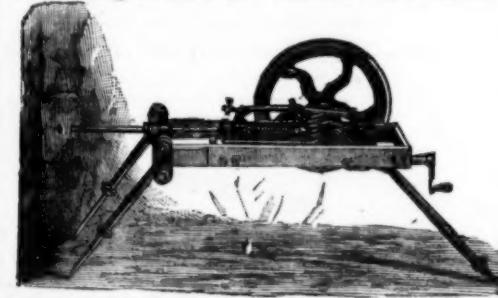
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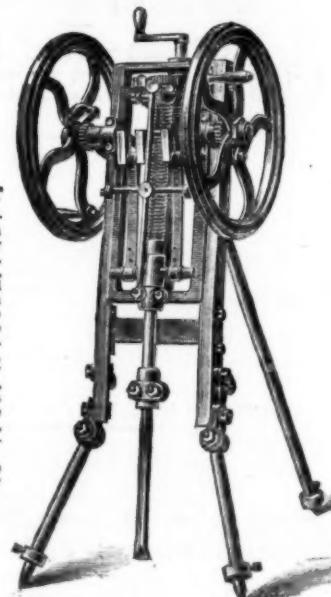
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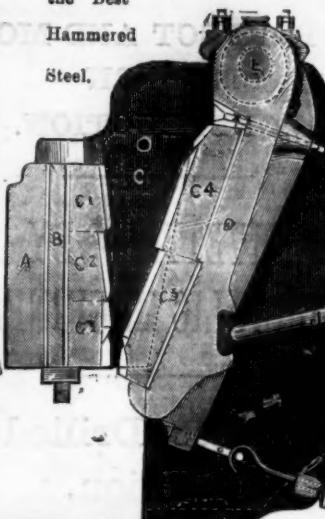
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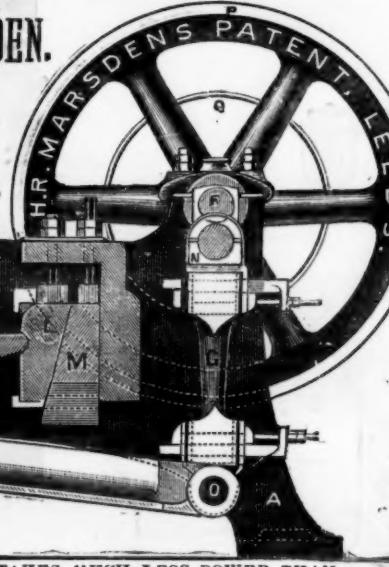
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